IRON TRADE REVIEW
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Pressure on Mills Is Intensified

Heavy Demand Taxes Producing Capacity—Efforts Made To Blow in More Stacks —Minimum on Plates, Shapes and Bars Is Shifted to Higher Level—Large Sales of Pig Iron Made

FACING a demand heavier than it has been at any time since 1920 and handicapped by a labor shortage and transportation difficulties, producers of iron and steel are hard pressed to satisfy the needs of consumers. This situation is reflected not only by the condition of order books, but by the sharp tendency toward higher prices, which during the week extended to pig iron, steel scrap, semifinished material and finished steel. As a result of price advances IRON TRADE REVIEW's composite of fourteen iron and steel products has jumped to $42.57 from $42.24 last week and $41.83 Feb. 7.

The increased pressure for finished steel has influenced blast furnace operators to start up idle stacks as promptly as labor and fuel conditions permit. The Carnegie Steel Co. is planning to light three furnaces shortly. When the ninth stack at the Edgar Thomson works is blown in Feb. 22, the company will have 47 out of 59 furnaces in blast. Several eastern stacks will be placed on the active list soon. One furnace of the Illinois Steel Co. was banked last week owing to the shortage of labor. Ingot production continues at about 85 to 90 per cent of capacity throughout the country, as estimated from conditions in the leading steelmaking districts. Sheet mills in the Mahoning valley are working at maximum capacity, but in Pittsburgh the rate is from 80 to 90 per cent. Tin plate, wire, strip and pipe mills in Allegheny county are operating at from 70 to 90 per cent of capacity.

Iron Sales Mount

Sales of pig iron attained unusual proportions. At least 70,000 tons of basic was sold in eastern Pennsylvania, 50,000 tons going to one consumer at $28 to $28.25, delivered. Business in foundry iron amounting to about 75,000 tons is in sight in this district. Sales in western Pennsylvania include 12,000 tons of foundry iron to one company and several lots of 2000 tons to other consumers. At least one sale has established the basic market at $27, valley. Inquiries for third quarter iron have been received in Chicago but they have been ignored. Sales in the New York market totaled about 45,000 tons, while reports from Boston indicate 12,000 were purchased in New England during the week. Inquiry at Birmingham, Buffalo, St. Louis, Cleveland and Cincinnati is heavy.

Steel Prices Higher

Quotations of 2.10c and 2.15c on steel bars and 2.20c on shapes and plates, base Pittsburgh, seem to be disappearing. Sales of plates and shapes by the leading producer indicate that 2.25c, Pittsburgh, now is the ruling quotation for these products for extended delivery. Material for from two to four weeks delivery is being sold by independent mills at levels as high as 3.00c. In many cases delivery takes precedence over price, and as a result a premium market exists for consumers requiring finished steel for early shipment.

Plates are in heavy demand as a direct result of recent locomotive, car and oil tank awards. The Baldwin Locomotive Works has placed 22,000 tons with eastern Pennsylvania mills and 10,000 tons still is pending. The Pennsylvania railroad has placed 5000 tons of car plates and needs 5000 tons more. Approximately 10,000 tons have been purchased for gas holders to be built in eastern cities.

Ruhr Stacks Blown Out

The Ruhr invasion has seriously affected production of iron and steel in Germany. The Berlin correspondent of IRON TRADE REVIEW cables that traffic in the Ruhr is 5 per cent of normal. Nineteen blast furnaces, 14 of which are at Krupp plants, have been blown out. The last German exports prior to the French embargo included 20,000 tons of rails for Argentina and 6000 tons for Japan. The effect of the occupation of the Ruhr is considered as nearly as serious as that of the recent war.

Importers of British ferromanganese increased prices to $110 duty paid, at tidewater, but before the new quotations went into effect orders for 8500 tons were booked at old prices. Domestic producers have not followed the advance.

Business Trend and Chart Section Page 577

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Steel Prices Reflect Strength

PRICES of finished steel have been going up rapidly in recent weeks. The average advance in the past three weeks of leading finished and semi-finished materials, for it must be remembered that the steel market embraces the disposal of large tonnages of semifinished as well as of finished materials, has been $2.50 to $3 per ton. This is the sharpest rise that the market has experienced since the period beginning late in August and extending through September and October during which the advance was influenced by the higher fuel values resulting from the effects of the coal strike and not by underlying trade conditions. Previous to the flurry occasioned by the coal strike from which the market subsequently relapsed, the present level of iron and steel is the highest since June, 1921.

Iron Trade Review composite of fourteen iron and steel products clearly reflects the general price situation at these comparative periods. Last week the composite stood at $42.24 compared with the average for all October last of $43.60, for September of $43.79 and for June 8, 1921, of $42.45.

The rapid rate at which prices recently have advanced is beginning to occasion words of caution among some of those producers who are accustomed to carefully weigh the situation as to its possibilities of stability and permanency. Whatever form conditions may take in the near future or later, however, it may be said that at present they exhibit no symptoms of insecurity or overstimulation.

Present steel prices appear to be based upon a sound economic foundation of a widespread and still developing demand from practically all the major sources of normal consumption and with no especial inflation of any kind, unless the automobile industry should be so considered. It is interesting to note that when the last comparable price basis of June, 1921 existed coke was selling $3 per ton lower, labor rates on the whole were less and in general a condition of lower costs prevailed. Higher production costs, obviously, do not protect the present situation from getting out of bounds but they do help and explain a rapid initial advance once general demand had risen to the point where the mills could be more selective in taking business.

This is the stage that the market has reached today. The question of the permanency of the present steel situation apparently rests with what producers may do with prices in the future and not with what has been done in the past.

Traffic Indicates Active Trade

TO THE observer of the business panorama as it unfolds from week to week, the current totals of car loadings are the source of never failing wonder. Surpassing all previous records, the volume of freight movements provides one of the most reliable indexes of present activities in trade and industry. As pictured in the Business Trend, January traffic outstripped not only the corresponding month in 1922, but also January of the boom year of 1920.

The car loadings for the week ended Feb. 3 amounted to 865,675 cars. This was 13 per cent above the high mark established for that week three years ago. Fortunately a considerable portion of the winter has passed without the appearance of a serious freight congestion. The net shortage of cars has fallen from 170,000 late in October to around 45,000 at present.

If the present rate of expansion in industry is maintained during the spring months and throughout the remainder of the year, a repetition of last autumn's shortage of cars is almost certain. In the meantime, however, the railroads are doing much to prepare themselves for the country's transportation requirements. With 180,000 freight cars purchased last year and a program of improvements calling for about $700,000,000 in 1923, equipment is being refurbished and augmented in keeping with nation's needs.

The outlook for the roads at present is regarded as fair, if not good. Between government war control and the exactions of labor unions, the railroads

have had many lean years. From all indications net incomes now are showing marked improvement, due to the great amount of traffic being offered. The December net for Class 1 roads was at the annual rate of 5.15 per cent on property investment. This is less than the 6 per cent contemplated by the Transportation act, but it is better than the 4.14 per cent actually earned in 1922; the 3.08 per cent in 1921, or the 0.09 per cent in 1920.

Distributing Steel in New England

DISTRIBUTION of iron and steel always has been an interesting topic, probably because little has been done to determine the destination of the various products of rolling mills. In the article beginning on page 581 of this issue, the consumption of iron and steel in New England is presented and analyzed. The compilation is especially significant because of the character of the manufactures in this district.

Once an important producer of iron and steel compared with other districts in the United States, New England now is almost entirely a consuming district. The value of iron and steel used in its various industries is approximately 6.8 per cent of the total of the United States. Bars and wire products predominate, as might be expected from the fact that so much of the capacity of New England's industries is devoted to making textile machinery, hardware and machine tools and accessories. Other products consumed to the extent of more than 100,000 gross tons annually are rails, strip steel, sheets and structural steel.

The figures presented in this article indicate the tonnage of ordinary products consumed in the manufacture of comparatively small articles such as shoe nails, eyelets, needles, pins, hooks and eyes, loom parts, typewriter parts, ball bearings, etc. New England's important industrial position is largely due to the native skill and ability of its workmen who, since the days of the colonies, have been famed for their proficiency in machining, fitting and assembling. IRON TRADE REVIEW's efforts in presenting these statistics for the first time are in line with its purpose to present original and reliable information on the distribution of iron and steel throughout the country.

Equipment Needed for River Project

THE controversy over the water rights of the Colorado river which has held up development of the river for many years and threatened to project it into the next generation was terminated last November when the representatives of the seven interested states entered into the Colorado River Compact. This compact divides the river into an upper and a lower basin and provides for irrigation and power developments. When ratified by the seven states, Arizona, California, Colorado, Nevada, New Mexico, Utah and Wyoming, it must be approved by congress. The Arizona legislature so far seems to be the only one disposed to object.

This compact promises much for the iron and steel industry. Waste waters are to be utilized for the generation of 6,000,000 horsepower, providing a tremendous market for construction equipment and for hydroelectric machinery. Many large dams will be necessary for flood prevention, again presenting a market for construction equipment on a large scale. Four millions of acres, now desert, will become tillable after irrigation. New homes for 3,000,000 persons will be made possible. The iron and steel requirements measured in agricultural implements, wire fencing, plumbing for homes, railroad and highway construction, and power transmission lines will be large.

Nor is this a dream, a possibility of the remote future. For more than two months last fall Secretary of Commerce Hoover stood between the representatives of the seven states at the Santa Fe conference and finally evolved the compact. It is probable that when congress convenes next December the states will all have ratified, and congress presumably will follow suit. Plans for the development of an area of 242,000 square miles—14,000 more than the entire state of Texas, are under way. This is a gigantic project and one in which the iron and steel industry will participate.

Broad Fundamentals

of Industrial Business Desired by Readers and Found in IRON TRADE REVIEW

WE are prompted by the letter of Mr. Lewis Owens, manager, The Stevenson Barn Equipment Co., Barton, Wis., to write you expressing our appreciation of the pages in your paper devoted to "The Business Trend." Like Mr. Owens, we are actively interested in the purchasing power of the farmer. We take this occasion to say that we appreciate the fact that your publication is not devoted exclusively to reports on iron, steel and coke conditions, but that through your editorials and special articles you give your readers a broad view of fundamental conditions affecting the iron and steel industry perhaps indirectly but certainly very strongly. We hope you will continue to touch on the condition of the farmer in this country, which just now is a subject attracting more interest than at any previous time in our memory. *W. A. Rockwell, manager, Harriman Mfg. Co., Harriman, Tenn.*

The particular feature of your paper that is of special interest to us, is "The Business Trend." It is worth considerably more to have these trends before us fresh every week than two or three months behind time. *H. J. Douglas, comptroller, Sherwin-Williams Co., Cleveland.*

I subscribed to IRON TRADE REVIEW more to keep in touch with what is doing in the primary markets and the fact that we are renewing our subscription each year is evidence that we are satisfied and pleased with the service you are rendering. *Hunt, Helm, Ferris & Co., Albany, N. Y.*

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Nine Years Ago

February 21, 1923	February 14, 1923	January, 1923	November, 1922	February, 1922	February, 1914
$42.57	$42.24	$41.17	$42.08	$32.86	$23.52

Products Included Are : ig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

SCRAP PRICES, PAGE 624, WAREHOUSE PAGE 616, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 620

Iron and Steel Prices

Pig Iron

Bessemer, valley	$28.00 to 28.50
Bessemer, Pittsburgh	29.77 to 30.27
Basic, valley	27.00
Basic, Pittsburgh	28.77
Basic, Buffalo	28.00
Basic, del., eastern Pa.	28.00 to 29.00
Malleable, valley	27.50 to 28.00
Malleable, Pittsburgh	29.27 to 29.77
Malleable, Chicago	30.00
Malleable, Buffalo	20.50
Malleable, del., eastern Pa.	29.50 to 30.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.23
No. 2 Southern foundr.	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	31.13 to 32.13
No. 1X, Buffalo	29.00 to 30.00
No. 2 foundry, valley	27.00 to 28.00
No. 2 foundry, Pittsburgh	**28.77 to 29.77**
No. 2 foundry, Buffalo	28.00
No. 2 foundry, Chicago	30.00
No. 2 foundry, Granite City	30.50 to 31.50
No. 2 foundry, Ironton fur.	28.50 to 29.00
No. 2 foundry, Cleveland del.	29.50
No. 2 foundry, del. Phila.	29.13 to 29.26
No. 2 foundry, N. J. tidewater	29.13 to 30.14
No. 2X, eastern del., Phila.	30.13 to 30.26
No. 2X, east. N. J. tidewater	30.13 to 31.14
No. 2X, eastern del., Boston	32.65 to 33.65
No. 2X foundry, Buffalo fur.	28.50 to 29.00
No. 2X Buffalo, del. Boston	32.91 to 33.91
No. 2 southern, Birminghma.	24.00 to 25.00
No. 2 southern, Cincinnati	28.05 to 29.05
No. 2 southern, Chicago	30.01 to 31.01
No. 2 southern, Philadelphia	31.80 to 32.80
No. 2 southern, Cleveland	30.01 to 31.01
No. 2 southern, Boston (rail)	34.61
No. 2 southern, St. Louis	29.17 to 30.17
No. 2X, Virginia furnace	27.50
No. 2X, Virginia Phila.	32.67
No. 2X, Virginia Jersey City	33.04
No. 2X, Virginia Boston	33.42
Gray forge, eastern Pa.	28.50 to 29.00
Gray forge, val., del. Pitts.	28.27 to 28.77
Low phos., standard, valley	**35.00 to 36.00**
Low phos., standard, Phila.	Nominal
Low phos., Lebanon furnace	30.00
†Low phos. British tidewater	31.50 to 32.50
Charcoal, Birmingham	32.50 to 34.00
Charcoal, Superior, Chicago	33.15

Silvery Iron
Jackson County Ohio, furnace

8 to 9 per cent	**$36.50**
9 to 10 per cent	**38.50**
10 to 11 per cent	**40.50**
11 to 12 per cent	**43.50**
12 per cent	**45.50**
13 per cent	**48.00**

Bessemer Ferrosilicon
Jackson County, Ohio, furnace

10 to 11 per cent	**$45.50**
11 to 12 per cent	**48.80**

Ferroalloys

Ferromanganese, 78 to 82 per cent domestic furnace	$107.50
Ferromanganese, delivered, Pittsburgh	112.42 to 114.79
†Ferromanganese, 79 per cent, English, c.i.f. Atl. port.	110.00
Spiegel 19 to 21 per cent furnace	**35.00 to 37.00**
Ferrosilicon, 50 per cent contract freight allowed	82.50 to 87.50
Ferrotungsten, standard, per pound contained	85.00

†Duty paid.

Ferrochrome, 60 to 70 chromium, 4 to 6 carbon per pound contained, makers plant	13.00
Imported ferrochrome, 4 to 6 per cent carbon	12.00
Ferrovanadium, 30 to 40 per cent per pound estimated, according ton analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$ 6.75 to 7.00
Connellsville foundry	8.00 to 8.50
Pocahontas furnace	nominal
Pocahontas foundry	nominal
New River furnace	9.50 to 10.00
New River foundry	11.50 to 12.50
Wise county furnace	7.50 to 8.50
Wise county foundry	8.50 to 9.50
Alabama furnace	7.00 to 7.50
Alabama foundry	**8.00 to 8.50**

By-Product

Foundry, Newark, N. J., del.	$12.84 to 12.91
Foundry, Chicago, ovens	15.00
Foundry, Boston, delivered	16.00
Foundry, Granite City, Ill.	15.00
Foundry, Alabama	8.00 to 8.50

Semifinished Material

BILLETS AND BLOOMS
(4 x 4-inch)

Open-hearth, Pittsburgh	$38.50 to 40.00
Open-hearth, Youngstown	38.50 to 40.00
Open hearth, Philadelphia	45.17
Bessemer, Pittsburgh	38.50 to 40.00
Bessemer, Youngstown	38.50 to 40.00
Forging, Pittsburgh	47.50 to 50.00
Forging, Philadelphia	52.67

SHEET BARS

Open-hearth, Pittsburgh	$40.00 nominal
Open-hearth, Youngstown	40.00 nominal
Bessemer, Pittsburgh	40.00 nominal
Bessemer, Youngstown	40.00 nominal

SLABS

Pittsburgh	$38.50 to 40.00
Youngstown	38.50 to 40.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$47.50 to 50.00
Grooved skelp, Pittsburgh	2.10c to 2.25c
Universal skelp, Pittsburgh	2.10c to 2.25c
Sheared skelp, Pittsburgh	2.10c to 2.25c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.25c
Structural shapes, Phila.	2.525c to 2.675c
Structural shapes, New York	2.54c to 2.69c
Structural shapes, Chicago	2.35c to 2.40c
Tank plates, Pittsburgh	2.25c
Tank plates, Philadelphia	2.525c to 2.675c
Tank plates, New York	2.54c to 2.69c
Tank plates, Chicago	2.35c to 2.50c
Bars, soft steel, Pittsburgh	2.15c to 2.25c
Bars, soft steel, Philadelphia	2.475c to 2.575c
Bars, soft steel, New York	2.49c to 2.59c
Bars, soft steel, Chicago	2.25c to 2.30c
Bars, refined iron, Pittsburgh	2.75c
Bars, rail steel, Chicago	2.10c
Reinforcing bars, Pittsburgh	2.10c to 2.50c
Bar iron, common, Phila.	2.475c to 2.575c
Bar iron, common, New York	2.49c to 2.59c
Bar iron, common, Chicago	2.50c

Hoops, Bands, Shafting

Hoops, Pittsburgh, large	2.90c
Hoops, Pittsburgh, small	3.00c to 3.40c
Bands, Pittsburgh	2.90c
Cotton ties, per bundle, Pitts.	$1.17
Cold finished steel bars, Pittsburgh base	**2.65c**
Steel shafting	**2.65c**

Rails, Track Material

Standard bessemer rails, mill	**$43.00**
Standard open hearth rails, mill	**43.80**
Relaying rails, St. Louis	**27.00 to 37.50**
Relaying rails, Pittsburgh	28.00 to 32.00
Light rails, 25 to 45, mill	2.15c to 2.25c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	**2.90c**
Spikes, small and boat, Pitts.	3.50c
Spikes, railroad, Chicago	3.15c
Track bolts, Pittsburgh	3.85c to 4.50c
Track bolts, Chicago	4.15c
Tie plates, Pittsburgh	2.60c to 2.80c
Tie plates, Chicago	2.45c

Wire Products

100 lbs. to Jobbers in Carloads

Wire nails, Pittsburgh	2.90c to 3.00c
Plain wire, Pittsburgh	2.65c to 2.75c
Annealed wire, Pittsburgh	2.80c to 2.95c
Galvanized wire, No. 9 gage, Pittsburgh	3.25c to 3.35c
Barbed wire, painted, Pitts.	3.35c
Barbed wire, galv., Pittsburgh	3.70c
Polished staples, Pittsburgh	3.35c
Galvanized staples, Pittsburgh	3.80c
Coated nails, count keg, Pitts.	2.50c
Woven wire fencing (retailers)	64 off
Woven wire fencing (jobbers)	66⅔ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts	6.25c
Sheet piling base, Pittsburgh	2.25c
Hot rolled strip steel, Pittsburgh stamping quality	2.90c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base	4.75c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pittsburgh	3.35c to 3.60c
No. 28, bessemer, Pittsburgh	3.35c to 3.60c
No. 28, open-hearth, Phila.	3.675c to 3.925c
No. 28, open-hearth, Chicago	3.59c to 3.69c

TIN MILL BLACK

No. 28, open-hearth, Pittsburgh	3.35c to 3.60c
No. 28, open-hearth, Chicago	**3.69c**

GALVANIZED

No. 28, open-hearth, Pittsburgh	4.35c to 4.75c
No 28 bessemer, Pittsburgh	4.35c to 4.75c
No. 28, open-hearth, Phila.	4.675c to 4.825c
No. 28, open-hearth, Chicago	4.64c to 4.69c

BLUE ANNEALED

No. 10, open-hearth, Pittsburgh	2.50c to 2.90c
No. 10, bessemer, Pittsburgh	2.50c to 2.90c
No. 10, open-hearth, Phila.	2.825c to 3.225c
No. 10, open-hearth, Chicago	2.84c to 2.89c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	4.70c to 5.25c

Tin Plate

Per 100 lb. box

Tin plate, coke base, Pitts.	$4.75

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Balck	Galv.
1 to 3-inch, butt steel	64	52½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Carload Discount 4 Points Larger

Steel, 3¼ to 13 inches, l. c.	45 off
Charcoal iron, 3¼ to 4½ inches l. c.	11 off
Seamless hot rolled, 3¼ to 4-in. l. c.	1.42 off

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	57.20 to 57.70
Six-inch and over, Chicago	53.20 to 53.70
Four-inch, Birmingham	49.00 to 49.50
Six-inch and over, Birmingham	45.00 to 45.50
Four-inch, New York	62.30
Six-inch and over, New York	57.30
Three-inch, Birmingham	52.00 to 52.50

Class A pipe is $4 higher than Class B. Standard fittings, Birmingham, base..$110.00 6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Feb. 21 1923	Jan. 1923	Nov. 1922	Feb. 1922
PIG IRON				
Bessemer, valley, del., Pitts....	$29.77	29.27	33.77	21.31
Basic valley	27.00	25.90	29.77	19.81
*No. 2 foundry, del. Pittsburgh	28.77	28.77	30.17	20.96
*No. 2 foundry, Chicago.....	30.00	28.80	30.60	18.90
Lake Superior charcoal, Chicago	33.15	33.15	36.15	30.50
Malleable valley	27.50	27.75	29.60	19.00
Malleable, Chicago	30.00	28.80	30.60	18.90
*Southern No. 2, Birmingham..	25.00	23.30	24.00	15.35
*Southern Ohio, No. 2, Ironton..	28.00	27.90	29.75	19.25
Basic eastern del., eastern Pa...	28.25	27.70	28.00	19.84
**No. 2X, Virginia furnace.....	27.50	27.50	31.40	22.00
**No. 2X, eastern del., Phila....	30.13	29.56	30.50	21.35
Gray forge val. del., Pittsburgh..	28.27	27.77	29.77	20.96
Ferromanganese, del. Pittsburgh	112.42	109.79	104.92	65.32
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pittsburgh	40.00	37.50	38.80	29.00
Sheet bars, open-hearth, Pittsburgh	40.00	37.50	38.80	29.00
Billets, bessemer, Pittsburgh....	40.00	37.50	38.80	28.00
Billets, open-hearth, Pittsburgh..	38.50	37.50	38.80	28.00
FINISHED MATERIAL				
Steel bars, Pittsburgh.....	2.20	2.00	2.00	1.40
Steel bars, Chicago	2.25	2.08	2.00	1.52
Steel bars, Philadelphia.....	2.575	2.385	2.325	1.76

	Feb. 21 1923	Dec. 1922	Oct. 1922	Jan. 1922
FINISHED MATERIAL Continued				
Iron bars, Philadelphia.....	$2.475	2.365	2.325	1.76
Iron bars, Chicago mills	2.50	2.35	2.50	1.60
Beams, Pittsburgh	2.25	2.05	2.00	1.40
Beams, Philadelphia	2.575	2.385	2.325	1.76
Beams, Chicago	2.35	2.18	2.10	1.52
Tank plates, Pittsburgh	2.25	2.05	2.00	1.40
Tank plates, Philadelphia.....	2.575	2.385	2.325	1.76
Tank plates, Chicago	2.35	2.18	2.10	1.52
Sheets, blk., No. 28, Pittsburgh.	3.35	3.35	3.35	3.00
Sheets, blue anl., No. 10, Pitts.	2.50	2.50	2.60	2.25
Sheets, galv., No. 28, Pittsburgh	4.35	4.35	4.35	4.00
Wire nails, Pittsburgh	2.90	2.70	2.70	2.45
COKE—				
Connellsville furnace, ovens	6.75	8.25	7.10	2.95
Connellsville foundry, ovens.....	8.50	9.00	8.40	3.80
OLD MATERIAL—				
Heavy melting steel, Pittsburgh..	24.00	21.65	20.40	13.95
Heavy melting steel, eastern Pa.	25.00	19.70	16.70	12.25
Heavy melting steel, Chicago....	19.75	18.70	17.40	11.15
No. 1 wrought, eastern Pa....	21.00	22.25	21.20	15.20
No. 1 wrought, Chicago	20.50	19.50	18.10	11.65
Rails for rolling, Chicago.....	22.00	20.50	18.90	11.50

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon

Volume of Iron Sales Increases

Purchases of 50,000 and 12,000-Ton Lots Are Features of Active Buying Movement—Basic Iron Now Quoted at $27—Producers Plan To Blow in More Stacks

Philadelphia, Feb. 20.—The past week has witnessed the heaviest business in the eastern pig iron market since 1920, the total even exceeding the records of December. The biggest buying is in steelmaking iron, at least 70,000 tons of basic having been sold. One consumer took a total of nearly 50,000 tons at $28 to $28.25, delivered. Numerous idle furnace plan to blow in. It is said the leading pipemaker is expected to place 75,000 tons shortly for various plants. Many inquiries are developing here. The Westinghouse Electric & Mfg. Co. and other consumers are in the market for substantial tonnages. Foundry iron is quoted at $28, base eastern Pennsylvania and New Jersey furnaces. One maker now is quoting $28.50 as the minimum with one dollar differentials. Others are expected to advance prices shortly. Virginia foundry iron is nominally $27, base plus 50 cents differentials.

Basic Iron Advances $1

Pittsburgh, Feb. 20.—Based on at least one sale of several thousand tons to a nearby melter by a valley producer, basic iron has advanced $1 per ton to a minimum of $27, valley. The Cambria Steel Co. last Saturday advanced in like measure to $27, f.o.b. Johnstown, and it, too, has advanced $1 per ton on foundry iron. Its minimum now on the No. 2 grade 1.75 to 2.25 silicon is $28, Johnstown, Pa. The freight rate from that city to Pittsburgh common points is $1.77. Valley makers are quoting a minimum of $27.50 valley, and all $27 prices have disappeared although sales consummated last week were on the $27, valley, basis. These included approximately 12,000 tons of foundry iron to the Standard Sanitary Mfg. Co. for Allegheny and New Brighton, Pa. plants divided among three or four producers, one receiving 1000 tons, another 2000 tons, a third 3500 tons and a fourth a still larger tonnage. These orders are an addition of this interest's purchase the preceding week of a similar tonnage of southern foundry iron for Louisville, Ky., at $25, Birmingham base. Other recent purchasers of foundry iron include a Springfield, O., user, 2000 tons at $27, valley and the U. S. Sanitay Mfg. Co., 1500 tons on the same basis. Some small lots of the No. 2 grade have carried the $27.50 figure and as indicated, that now is claimed to be the market minimum on the base grade. Small sales of bessemer continue to be reported from time to time at $28, valley, and now $28.50, valley, or f. o. b. Johnstown is the minimum quotation out. These figures have been filed on one or two inquiries current here for 300 or 400 tons each. The Westinghouse Electric & Mfg. Co. asked for 600 tons of bessemer for delivery in the sceond quarter to its Eddystone, Pa., plant. Follansbee Bros. Co. sent out an inquiry yesterday for 5000 to 6000 tons of basic and the Sharon Steel Hoop Co. so far as reported has not closed on its requirements of 1000 tons. The market is quotable at $27.50 to $28, valley. Small lots of low phosphorus copper free iron continue to move at $35 valley.

Northern Firm at $30

Chicago, Feb. 20.—Northern pig iron is firm at $30 for all deliveries, 50 cents being added for the first step in silicon and $1 afterward. Producers just east of Chicago apparently have

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stopped selling. The sale of 2000 tons, with equal freight rate, was made by a Chicago producer without competition. Southern iron is $25, Birmingham, quoted by practically all makers. Much iron is being sold outside of Chicago. A Chicago melter has closed for 2000 tons of southern iron, and two northern Illinois melters have purchased 1000 and 500 tons, respectively, of southern iron. There is an inquiry from a Michigan user for 500 to 1000 tons of northern iron. Many inquiries are of the same size. Superior charcoal iron has advanced $1.50 to $31.50 furnace, or $34.65, Chicago. Heavy sales have been closed and users want more. An eastern low-phosphorus maker has advanced $2 to $39, delivered Chicago. Silveries are quiet and Jackson county prices are unchanged.

Southern Ohio Market Active

Cincinnati, O., Feb. 20.—The week just closed was the largest in volume of sales of pig iron since the first of the year. The sales involve lots ranging from 100 to 3000 tons. The market is decidedly firm, especially for northern iron. The tendency of the market is upward. Several important inquiries are before the trade. Southern furnaces are quoting $25, Birmingham base, while the southern Ohio market is firm at $28, Ironton base. The most important sale is that of the Williamson Heater Co., Cincinnati, which closed for 3000 tons of southern. A central Ohio consumer took 2000 tons of northern iron while a southeastern Ohio manufacturer closed for 1000 tons of northern. In addition to these tonnages there are a number of sales involving 100 to 500 tons. An Indiana consumer bought 500 tons of southern iron for third quarter. Inquiries are numerous. The American Radiator Co. is in the market for 2500 tons of northern iron for its Springfield, O., plant and 2500 tons of southern for North Birmingham. The National Malleable Casting Co. of Indianapolis is said to be negotiating for 4000 tons of northern iron. A southern Ohio furnace has withdrawn from the market pending developments, while the Tuscaloosa furnace, which withdrew a week ago, has sold 2000 tons for second quarter delivery at $27, Birmingham base. Charcoal iron is displaying considerable strength and several good sales into Michigan have been reported. A majority of the furnaces have good order books and are waiting until after April 1, in anticipation of a higher market before accepting any further business.

Eastern Sales Heavy

New York, Feb. 20.—Greater activity is reflected in the pig iron market here than at any time since the active buying movement of the last two weeks in December. Sales of the past week in this district aggregated at least 45,000 tons. While the bulk of the tonnage is for second quarter delivery, the volume of first quarter buying is surprisingly large, many melters finding that they are consuming more iron than they expected at the time they placed their first quarter contracts. Numerous inquiries are under negotiation, involving mostly small tonnages. The largest inquiry is one from the New York Central railroad for 1000 tons of foundry for prompt shipment to Frankfort, N. Y., and Elkhart, Ind. A Connecticut melter is in the market for 1000 to 1200 tons of foundry and malleable for second quarter. The largest purchase of the week involved 5000 tons of 3 to 3.50 per cent silicon foundry iron for the Elizabethport plant of the Singer Mfg. Co. This company owns its own blast furnace at Musconetcong, N. J., and the decision to buy iron was made after the coke market and other factors involved in the operation of the furnace had been studied. The Singer company bought 3000 tons from an eastern Pennsylvania maker and 2000 tons in Virginia. The iron is understood to have been placed at $31.76 and $32.04, delivered. Shipments are to be made over March, April and May. The Worthington Pump & Machinery Corp. has closed for 3975 tons of foundry iron for second quarter, including 1525 tons for Harrison, 800 tons for Holyoke, 500 tons for Cudahy, 400 tons for Buffalo, and 750 tons for Elmwood Place. A radiator interest has bought 4500 tons of foundry iron for the second quarter. Two New England consumers during the past week bought 3500 tons and 1500 tons respectively, for the second quarter, and numerous smaller lots have been placed in New England. The Thatcher Furnace Co. has placed 1600 tons, for second quarter, including 1000 tons, for second Pennsylvania and 600 tons of European foundry iron. Another New Jersey interest has closed for 1000 tons for second quarter. A new York state stove manufacturer has bought 2000 tons.

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Price advances are contemplated and producers say that the market on eastern Pennsylvania foundry iron will be at least $1 higher before the end of this week. So far, however, no change has been reflected in actual business. The market on eastern foundry iron continues $28, base furnace, plus $1 silicon differentials. On the higher silicons, however, the full $1 differentials do not always apply. Central Pennsylvania foundry now is quoted at $27.50 to $28, base furnace, plus both 50 cents and $1 silicon differentials. Despite firmer indications of a week ago, further business in Buffalo foundry has been transacted at $27.50, base Buffalo, plus both 50 cents and $1 silicon differentials. Anything below $28 base, Buffalo, however, now is regarded as exceptional, and it probably would be difficult to shade $28. The market on Virginia foundry generally is regarded as $27 base furnace, plus 50-cent silicon differentials, although large tonnages are subject to negotiation. The purchase of the Singer Mfg. Co., for instance, went at lower than the $27 base price.

Steel Demands Stiffen Iron Prices

Boston, Feb. 20.—The increasing demands made on eastern steel mills is having the effect of cutting down the amount of foundry iron offered in this market. Several of the most active sellers of pig iron recently have been the steel companies, but blast furnace capacity is being switched over to basic iron for steel production, and this leaves the field open to the merchant furnaces and to foreign iron. As a result prices have stiffened considerably in New England during the past week, although here and there low spots still exist. Buffalo furnaces are nearly all firm at $28, with 50-cent differentials. The differential in the case of No. 2X iron (2.25 to 2.75 silicon) was dropped by one furnace. Eastern Pennsylvania furnaces range in base price from $28 to $29. One furnace with an eastern Pennsylvania freight rate has sold No. 2X iron rather freely during the past week at $28.50, furnace, or $32.15, delivered. Southern furnaces continue to sell a fair tonnage for mixture purposes at $25, base furnace, or $32 to $34, delivered, depending upon location. Foreign iron is offered at $27 to $30, duty paid, Boston. Iron inquiry for second quarter delivery is improving, and nearly all buying at present is either for prompt delivery or for second quarter. Sales during the past week include approximately 2000 tons to a textile interest, 1200 tons to a Massachusetts foundry, 400 tons to an electrical manufacturer, and scattered orders ranging from 100 to 500 tons bringing the total to 11,000 or 12,000 tons. Inquiry includes 1000 tons for a heater manufacturer and several thousand tons for a western Massachusetts foundry. Foreign iron received at Boston during the past week totaled 1730 tons.

Market Growing Stronger

Cleveland, Feb. 20.—Pig iron prices continue to advance, and a very strong situation is developing by reason of the fact that some of the leading sellers are heavily committed for the second quarter and only a portion of the demand has been satisfied. The market is described by one merchant as fully as strong as in 1920, and this interest is shaping its course on the assumption that foundry iron for the second quarter will go to $35. Certain interests are refusing business, in the face of persistent and voluminous inquiry. One maker that has been particularly active in the last few weeks in booking for the second quarter has turned away offers of 10,000 tons in the past week. A feature of the market at present is the renewed interest in basic. Some large tonnages have been closed, and inquiries for several round lots have come out this week.

The highest price done on foundry iron in the present movement by the interests represented in the northern Ohio group is $31, Detroit, for a tonnage of the base grade for prompt shipment. Another lake furnace interest has again advanced its price 50 cents, quoting a minimum of $30, base furnace, this price representing an increase of $1.50 within two weeks. Sizable lots have been closed at the advanced price. A Michigan manufacturer of automobile castings has closed for 2000 tons; a Michigan implement maker, for 2000 tons, and another Michigan user, for 1000 tons, all for the second quarter. A price of $28.50, valley, has been done on 5000 tons, sold by a northern Ohio interest in the week, and as high as $29 has been obtained on some tonnage at Buffalo. The Cleveland interest has advanced another 50 cents to $29.50, furnace, for all delivery. The American Radiator Co., Buffalo, is inquiring for 5000

tons of foundry iron. There is an inquiry pending here for 5000 tons of malleable, another for 1000 tons of foundry.

The market for basic iron is showing more strength. Sales have been made in the week at $27, valley, an advance of $1 over the price done a week ago. The Follansbee Bros. Co. is inquiring for 5000 tons of basic.

More Southern Iron Sold

Birmingham, Ala., Feb. 19.—South- large tonnages have been booked here, including 10,000 tons for a maker of sanitary ware. The local consumption is heavier than it was during the world war. Makers of pressure and soil pipe have many orders in hand which will require much iron. Additions are being made to plants in this district and new plants are being constructed, some of which will begin operation next month. Quotations for pig iron are firm at $25 for No. 2 foundry. Third quarter business is

Buffalo Price $28

Buffalo, Feb. 20.—Inquiry is pending for 7500 to 10,000 tons of pig iron of various grades. Furnaces have little to sell for the first quarter, and selling is principally for second quarter. The market is $28 for No. 2 plain, (1.75 to 2.25 silicon) though makers have gone below this figure. No. 2X foundry is being quoted at $28.50, and No. 1X at $29. Basic is to be had at $28 and malleable at $29. Sixteen furnaces are operating.

Small Lots Sold

St. Louis, Feb. 20.—With the exception of 5000 tons of basic, sold by the leading local producer to an east side interest, transactions in pig iron during the past several days have been confined exclusively to small lots ranging from single cars to 150 tons. There continues a fair inquiry, aggregating at the moment approximately 5000 to 8000 tons. Many of the principal melters have satisfied their wants for the near future. Considerable iron is still to be purchased for the first half. Thus far there has been no move on the part of melters to engage iron for second half and leading furnace interests are not willing at this time to deal further ahead than the end of June due to uncertainty relative to labor, raw material and transportation costs. A scarcity of specific grades and analysis is developing, and a number of orders offered since the first of February have been declined because of inability to furnish the material desired. Cold weather and snow have seriously interfered with deliveries throughout the West. Large tonnages from the North and South, which were expected here during the first week of February, have not arrived. Melters in the district, including stove builders, makers of machinery and job foundries, have taken on additional business during the past two weeks, and all plants are working as near capacity as conditions of labor and material supplies will permit. Stove plants in Quincy, which had been down for inventory and repairs resumed activities last week. There has been no change in prices, quotations holding firm at the recent advance. Southern iron is held at $25, and northern at $29 to $30.

Contract for Furnace Coke

Youngstown Consumer Closes for 12,000 Tons Monthly to July 1 at $6.75—Foundry Grade Is Lower

COKE PRICES, PAGE 556

Pittsburgh, Feb. 20.—Another contract for standard furnace beehive coke has been taken at $6.75. This refers to the requirement just closed by the Youngstown Sheet & Tube Co., Youngstown with an important maker of high-grade fuel in the Uniontown, Pa. district involving 12,000 tons monthly to July 1. This buyer had but one or two offers below $7 on what is considered high-grade coke and at the present time there are but one or two such offers current, nearly all producers quoting a minimum of $7. The market, therefore, remains quotable at $6.75 to $7; the level reached one week ago. Several inquiries are current for second quarter coke requirements, one or two from Buffalo interests, including a tentative one from the Bethlehem Steel Co. for the Lackawanna Steel Co.'s stack. At least three are before coke producers, coming from Pennsylvania blast furnace operators, including the Seaboard Steel & Manganese Corp., Temple, Pa., Joseph E. Thropp, Everett, Pa., and the Eastern Steel Co., Pottsville, Pa. Demand for heating coke from the East, West and Canada largely has disappeared, although there was some additional buying last week at around $6. Foundry coke this week is selling at $8 to $8.50 or 50 cents under the level prevailing one week ago. Some brands continue to demand premiums above that maximum of at least 50 cents. Spot sales usually comprise a carload or two at a time although five or 10 carloads sometimes are bought. Production, according to the *Connellsville Courier*, registered an increase of more than 15,000 tons in the week ended Feb. 10. It estimates production for that week as being 259,780 tons, compared with 244,100 tons the preceding week.

Foundries Buying More Coke

Cincinnati, O., Feb. 20.—Demand for foundry coke is the outstanding feature of the Cincinnati market. The call for coke on contracts has been exceedingly active during the past week. Foundries engaged in automobile work are buying better than they have been for some time. Prices show signs of weakening. The unfavorable rail situation is preventing the movement of coke to a certain extent. Domestic demand has eased off and screen sizes are available in larger tonnages than for some time. In the Connellsville district orders are being accepted for available equipment only. The car situation in the Wise county district is said to be the worst in its history.

Prices Hold Firm

Boston, Feb. 20.—Embargoes against shipments of coke entering New England continue and as a result the local situation is relatively independent of the Connellsville market. Good grades of Connellsville coal have been offered at new low figures yet the demand from the local by-product producers continues urgent and prices remain unchanged. The Providence Gas Co. is shipping coke against contract at $15, delivered, and the New England Coal & Coke Co. holds to $16, delivered. Spot tonnage is accepted sparingly by these concerns, but where real need exists foundries are taken care of. A good grade of Connellsville coke was offered during the week at $14.54, delivered, and it seems likely that when the present freight situation is cleared up, by-product prices will be forced down to meet the Connellsville competition.

Price Situation Easier

New York, Feb. 20.—Prices on coke continue to sag and standard beehive foundry fuel for prompt shipment now is easily obtainable at $8, Connellsville, although there still are some sales at $8.25 and $8.50. While coke now can be shipped to a number of points which recently were embargoed, the easier price tendency continues by reason of the falling off in demand from the dealers who have been retailing coke for use as household fuel. While foundries are buying to some extent the easier prices are causing them to delay action wherever possible. The Seaboard By-products Coke Co. continues to quote $12.84 to $12.91, delivered at Newark and other northern New Jersey points for its by-product foundry coke.

Demand Still Active

St. Louis, Feb. 20.—The demand for coke continues active. Local by-product plants are well sold up on heating coke, and have rejected additional business. Metallurgical coke is scarce and producers and selling agencies have been deluged with requests to expedite shipments. The movement from the South and East has been delayed by unfavorable weather. Representatives of eastern ovens report that it is virtually impossible to obtain box cars for coke shipments, and are refusing to take orders specifying that equipment. Prices asked by the local by-product ovens are as follows: Dealers, $11; industrial coke, $12, and foundry $15. There has been no change worthy of note in the coal situation, the general demand continuing quiet.

Southern Ovens Active

Birmingham, Ala., Feb. 19.—Coke consumption in the southeast territory and shipments from this district are such as to warrant steady operation of the ovens. All by-product coke oven plants of the Birmingham district are now operating, and with one or two exceptions are producing at almost full capacity. Quotations for coke are firm. Spot coke orders are frequent, though the tonnage is not very large. This business brings $1 or more per ton over the contract price. Consumption in the Birmingham territory will be larger in March, one or two new industries contracting for coke.

Bar Demand Is Heavy

Mills Continue To Decline Additional Tonnage as Books Are Filled Far Ahead—Premiums Being Offered and Prices Are Stronger

BAR PRICES, PAGE 556

Chicago, Feb. 20.—Sales of soft steel bars continue in excess of production and Chicago mills are turning down considerable inquiry. Specifications are being filled in full, as all contract holders desire every pound mills can give them. Demand from agricultural implement makers is increasing and automobile builders are making plans for a larger output than first estimated. The leading interest is quoting 2.30c, Chicago mill, on bars while Inland Steel Co. has divided its entire second quarter production among its regular customers at 2.40c, Chicago mill.

Bar iron remains firm at 2.50c, Chicago mill, with mills producing at the highest rate circumstances will permit. A comfortable backlog has been accumulated by practically all and demand keeps up at least equal to production. Rail steel bars are in steady demand, about equal to production and the price is firm at 2.10c, mill.

New Sales Somewhat Limited

Pittsburgh, Feb. 20.—While new sales of merchant steel bars are limited in size they are numerous. This possibly is attributable to the fact mills are so filled with business, they do not care to accept larger lots. Specifications are heavy on contracts. Individual lots received during the past week involve 1000, 1200 and 1500 tons at a time. While the 2.10c, base Pittsburgh, figure, still appears, it is purely nominal and 2.15c and up to 2.25c are being done. All consuming lines are active and promise to continue so for some time unless choked off by the runaway steel prices.

Refined iron has advanced another $2 per ton to 2.85c, base Pittsburgh. Demand for these bars has increased greatly in the past few weeks and at times several hundred tons are involved in a single order. The majority are for smaller amounts and occasionally a larger tonnage is noted.

Premiums Are Appearing

New York, Feb. 20.—Premiums are beginning to make their appearance in connection with steel bars for prompt rolling. For a moderate-sized tonnage of bars for prompt rolling an exporter has paid 2.75c base Pittsburgh. This figure was considered desirable in view of the fact the exporter otherwise would have had to buy the bars at the regular warehouse quotation. All bar makers are sold ahead extensively and are not eager to take on additional tonnage, although they are taking pains to meet the requirements of their regular trade. While the leading interest has a minimum price of 2.15c base Pittsburgh on bars, the minimum with the independents generally is 2.25c. Most independents now are quoting $3 higher on cold-rolled steel, the new price being 2.80c base Pittsburgh.

Continue at Lower Level

Philadelphia, Feb. 20.—While Pittsburgh and Middle Western bar producers are quoting from 2.25c to 2.35c base Pittsburgh, eastern makers continue at the lower level, their quotations ranging from 2.15c to 2.20c, Pittsburgh.

Makers Selecting Tonnage

Buffalo, Feb. 20.—Steel bar makers are selecting tonnage with care, accepting only the most attractive. The mill which has been booking actively is taking nothing under 2.25c, Pittsburgh, and has taken some 2.35c business. Mills which are declining to quote, take the position the market is not weaker than 2.20c, Pittsburgh. Agencies for one valley and one Pittsburgh mill are out of the market. The leading interest is said to be quoting 2.15c. Extraordinary production is being obtained by local mills.

Bar Demand Strong

Cleveland, Feb. 20.—Demand and inquiries for bars continue strong due largely to the activities of automobile builders, agricultural implement manufacturers and others. At present there is no indication of any let-up in the rate of production of automobiles and the daily output in Michigan is estimated at from 11,000 to 13,000 cars daily. It is understood that owing to inability to receive parts and material the leading automobile manufacturer has reduced production about 400 cars daily. The lower quotations on steel bars have stiffened and 2.25c, base, Pittsburgh, is not far from a prevailing quotation by the leading interest. Other producers are asking as high as 3.10c, Pittsburgh.

Another $3 Advance Announced

Pittsburgh, Feb. 20.—Effective yesterday, cold-drawn steel bar and shafting manufacturers such as the Wyckoff Drawn Steel Co., the Columbia Steel & Shafting Co., and other finishers here inaugurated another advance of $3 per ton on cold-drawn bars and shafting, going to 2.80c, base Pittsburgh. These commodities reflect the continued upward march of prices in raw material. Specifications are heavy and second quarter contracts now are coming up for consideration. Shipments in some cases are two months deferred so that really the second quarter period already is being entered, although some makers had not up to yesterday opened their books for that period. Satisfactory rolling schedules are possible as individual orders are large and specifications on the more popular shapes sizable.

Book Hoop Specifications

HOOP PRICES, PAGE 556

Pittsburgh, Feb. 20.—Several weeks' business in hoops and bands is ahead of makers on an 80 to 90 per cent operation basis and specifications continue to be received in pleasing tonnages. New business is being booked at a minimum of 2.90c although shipments on some contracts are being billed lower. Small hoops and bands narrow sizes and thin gages, are quoted 3.00c to 3.40c, base Pittsburgh. Hot-rolled strip steel makers report a fair number of orders for the latter material and all producers state a fairly large number of orders are coming out.

Spot Tonnages of Bolts, Nuts Bring Premiums

NUT AND BOLT PRICES, PAGE 620

Cleveland, Feb. 20.—Spot tonnages of bolts and nuts have been placed in this district at premiums above the quoted prices of from 2½ per cent to 10 per cent. In one instance a large consumer was able to place 200,000 carriage bolts with a local maker for prompt delivery. However, in order to obtain this delivery he had to pay a premium of 10 per cent. While this case is perhaps exceptional, numerous instances are noted of smaller premiums being paid . The market is exceptionally steady, and orders are coming from practically all consuming sources. Probably the most encouraging development is the buying by implement manufacturers who had been out of the market for many months. Many of these interests had failed to anticipate their requirements and as a result are being forced to take whatever tonnages become available at current prices. In connection with second quarter business, books will not be opened for several weeks. However, in the case of some makers, all such business booked will practically be for third quarter delivery as many makers' books already carry them far into the second quarter production.

Rivet demand continues to improve and the recent shading of prices has disappeared. So far as can be learned no premiums are being asked for spot tonnages, but for that matter little of this class of business is out. Boiler and structural rivets continue quoted 3.10c and 3.00c base Pittsburgh. Higher prices are expected on second quarter contracts. Current specifications are fairly heavy.

Specification Stream Steady

Pittsburgh, Feb. 20.—A steady stream of specifications is flowing to producers of nuts, bolts and rivets here and demand is coming from every direction. Specifications have been particularly heavy on contracts with railroads as well as other large users. Individual requirements are large. A price advance is expected to develop within the next week or 10 days. Evidently there is more than enough business to go around. Carload orders of rivets as well as nuts and bolts are typical, while specifications for larger tonnages are received from time to time. Structural and boiler rivets still are quoted at 3.00c and 3.10c, base Pittsburgh, respectively; smaller rivets at 65 and 5 off; and large machine bolts at 50 and 10 off.

No Shading on Bolts

Chicago, Feb. 20.—Prices of bolts and nuts are steady and there is no shading. Producers are busy with full

order books and considerable spot business is coming out, but buyers on specification find it difficult to obtain prompt shipment, as contract business has the advantage. Inquiry for second quarter contracts has not yet appeared.

Ferromanganese

Makers Hold to Old Price as British Material Advances

FERROALLOY PRICES, PAGE 556

New York, Feb. 20.—On Saturday importers were instructed by their English principals to advance prices on English ferromanganese from $107.50 to $110, duty paid tidewater. Before the advance New York importers booked at least 11,000 tons at the old price. Domestic makers continue to quote $107.50.

Sales of domestic spiegeleisen during the past week aggregated at least 2500 tons. The market on domestic spiegeleisen continues $35 to $37, furnace, for 20 per cent, depending on the size of the tonnage and time of delivery.

Good remand is reported for special ferroalloys and ferrosilicon. Prices in some cases advanced during the past week. Sales of 50 per cent ferrosilicon in carlots are reported at $90, delivered and $87.50 now is minimum. An inquiry for 300 tons of 4 to 6 per cent carbon ferrochrome is in the market. The quotation for this grade is 12 cents a pound contained. Two inquiries for ferrotungsten, involving 75,000 pounds of contained are in the market. Prices for ferrotungsten are firm at 88 cents a pound contained and for tungsten powder at 94 cents to $1, according to quality and quantity. Tool steel makers and railroads have been large buyers of ferrovanadium at $3.50 to $4 a pound contained. Quotations on the tool steel grade are higher at $3.60 a pound contained and higher, according to quantity. Indian chrome ore now is held at $20 a long ton, c. i. f. Atlantic port; New Caledonian, $24 to $26, c.i.f. An inquiry for 1000 tons is in the market.

More Sizable Lots Sold

Pittsburgh, Feb. 20.—More sizable lots of ferromanganese again are noted in the ferroalloys market. One domestic producer reports the receipt of four orders aggregating in excess of 3000 tons. Sales of British material aggregated approximately 2000 tons. Several other lots still are under negotiation. These orders which were taken for delivery over the second quarter, with some tonnage extended over the remainder of the year, carried the $107.50, seaboard base figure, or $112.29, delivered Pittsburgh. Included among those who recently entered the market for ferromanganese are the Edgewater Steel Co., and the Weirton Steel Co. Importers of English material were notified Saturday and Monday that the market had advanced to $110, duty paid, seaboard or $114.79, delivered Pittsburgh, for delivery in May and June and the third quarter.

The Cambria Steel Co. continues to offer spiegeleisen and has taken an order for 1000 tons from an Ohio consumer at $36, furnace, which is the quota-

(*Concluded on Page* 568)

Buying Plates for Cars

Eastern Railroad Requirements Heavy—Strong Demand Continues for Tank Material—Premiums Offered for Prompt Tonnages

PLATE PRICES, PAGE 556

Chicago, Feb. 20.—Buying of steel plates for tank work continues an interesting feature of this market as the oil companies add to their storage facilities. The Standard Oil Co. of California is in the market with an inquiry for 6000 tons of plates for tank work. The Chicago Bridge & Iron Co. has taken 7500 tons of plates for 25 storage tanks of 80,000 barrels each for the Pan-American Petroleum & Transport Co., San Pedro, Cal. A considerable tonnage still remains under protection by Chicago mills. Inland Steel Co. has divided its second quarter plate production among its regular customers on the basis of 2.50c, Chicago mill. The Illinois Steel Co. continues selling for delivery at convenience at 2.25c, Chicago mill.

Eastern Demand Heavy

New York, Feb. 20.—Heavy buying continues to feature the plate market here. The most spectacular business is involved in railroad car requirements. This business is being placed quietly, mostly with the leading interest and some with independents. The American Locomotive Co. is a consistently heavy buyer for new locomotive orders and a good deal of tank work continues to come out. The American Bridge Co. has booked 1200 tons for tanks for the New England Oil Co. at Fall River, Mass. The Texas Co. is in the market for several tanks and this interest also is taking bids on 1200 tons of plates and shapes. The Standard Oil Co. of New York has 18 to 20 55,000-barrel tanks, involving 3500 to 4000 tons of steel, under negotiation. The Sinclair interest for the moment is out of the market, except for a few tanks for a southwestern point and the placing of these is being negotiated at Chicago. While the leading interest continues to quote 2.20c, base Pittsburgh, on plates, the minimum with independents is 2.25c base, Pittsburgh, and some of them are turning away practically all business, while the others are picking their tonnage carefully. Some plate tonnage has been sold in carload lots at 2.35c base Pittsburgh, but so far such a price is exceptional. One eastern mill now has a minimum of 2.50c, base Pittsburgh, on plates.

Tank Inquiries Are Numerous

Pittsburgh, Feb. 20.—Fabricators in the Pittsburgh district have been called upon to consider a large number of small inquiries for tanks involving one or two tanks each. The tonnage of plates involved aggregates 10,000 to 15,000 tons. These are in addition to the two or three larger tanks for western and southern oil companies which still are current. Barge builders are inquiring for plates from time to time, such as the Midland Barge Co. and the Treadwell Engineering Co. The Charles Ward Engineering Co., Charleston, is understood to have ordered the plates needed for the pipe line dredge recently awarded it for use in the Cincinnati district. It now is difficult to locate plates at 2.20c, base Pittsburgh, and up to 2.35c is being quoted, that figure being obtained f.o.b. Coatesville, Pa., by one mill on further tonnages this week, which is practically 2.70c, delivered Pittsburgh. Buyers are offering premiums for prompt delivery of plates as well as other steel products.

Advances to 2.25c

Buffalo, Feb. 20.—Demand for plates is good and some mills are almost out of the market on certain sizes. The leading interest is understood to have gone to 2.25c.

Buying Has Increased

Philadelphia, Feb. 20.—Plate buying has increased in this district during the past week. Prices are higher. Two eastern mills now are quoting 2.50c, base, Pittsburgh, and it now is impossible to buy from independents less than 2.25c, minimum. The leading interest continues to quote 2.20c but this makers is obtaining 2.25c on most sales. Huge locomotive plate business has come out. The Baldwin Locomotive Works has just placed 11,000 tons for 275 locomotives for the Pennsylvania railroad, 6000 tons with the Midvale Steel & Ordnance Co. 3000 tons with the Worth Steel Co., and 2000 tons with the Lukens Steel Co. At least 10,000 tons is involved in locomotive plate inquiries now pending. The Pennsylvania railroad has placed from 5000 to 6000 car plates and needs at least 5000 more. The Cruse Kemper Co. booked a contract for building a gas holder at Germantown, Pa., requiring 1200 tons of steel mostly plates. The Bartlett Hayward Co. has booked an order for a gas holder at Camden, N. J., requiring 4000 tons. A steel gas holder involving 4000 tons for the United Gas Improvement Co. at Port Richmond, Philadelphia is about to be let. Awards are expected shortly for large gas holders at Elizabeth, Longbranch, Port Arthur and other cities. The department of wharves, docks and ferries, Philadelphia, is taking bids on a small boat involving less than 100 tons.

Steel Car Has Deficit

The Pressed Steel Car Co., Pittsburgh, reports an operating loss for 1922 amounting to $810,606. Total income of the company was $868,918 and the balance was $58,312. After deducting dividends of $875,000 and depreciation and other charges of $400,000, making total deduction of $1,275,000, there was a deficit of $1,216,688. Working capital and surplus as of Dec. 31 was $13,461,211. President Hoffstot said 1923 should be a fair year. During the last quarter of 1922 the company booked substantial business which will be executed during the current year. Unsettled foreign conditions, added to high surtaxes and immigration restriction are adverse factors in the present outlook, President Hoffstot said.

Scrap Maintains Strength

Consumer Buying Continues Limited to Small Tonnages—Prices Continue To Advance—Shipments Improving—Scarcity Still Threatens

SCRAP PRICES, PAGE 624

Chicago, Feb. 20.—With relatively little scrap coming out at present and further curtailed by the recent cold weather, which interfered with shipping, the market for iron and steel scrap at Chicago is tight and comparatively inactive. The actual tonnage moving is unusually small. However, there is a market for all offerings and while consumers are not in the market they are willing to buy and dealers could sell a large tonnage for which they would be forced to search diligently for scrap to fill. This is the case in recent sales of malleable scrap and dealers who took the tonnage are having difficulty in finding sufficient to make shipments. Malleable and gray iron are in exceptionally good demand and light supply. Rolling mill grades are comparatively slow and steel is also without feature. The Rock Island railroad has issued a list offering 4700 tons and the Illinois Central railroad 2400 tons. The Wabash railroad has issued an open list.

Scarcity Is Threatening

New York, Feb. 20.—Strength continues to dominate the local iron and steel scrap market, with further advances in some grades, such as shafting, steel car axles, wrought pipe, and borings and turnings. The traffic tie-up in New England, complicated by inclement weather conditions throughout the East generally, has made for a scarcity that is being felt at all the principal consuming centers. Some dealers claim the situation fast is assuming the aspect of a runaway market.

Strong Position Is Maintained

Pittsburgh, Feb. 20.—Scrap maintains a strong position and prices continue upward. The shortage of scrap is almost acute and the Pittsburgh district yards maintain practically none except that which already has been sold. Scrap yards East, West, North and South likewise are depleted; hence, no stocks are available. Sales of heavy melting steel have been made at $24, and $24.50 has been quoted on some small lots. Consumers now are offering to pay $24 but cannot get takers. One large independent steel interest here wants 25,000 to 50,000 tons, but with dealers not inclined to sell short at even $24.50, from $25.00 to $25.50 or higher undoubtedly will have to be bid by any consumer entering the market for such large amounts. Sales of other grades have involved 500 to 1000 tons at a time and a fair amount of activity is noted. Machine shop turnings have brought $19.50; railroad malleable, $26.50; No. 1 cupola cast, $25.50; bundled sheets, $21; cast iron borings, $21; No. 2 wrought, $24.50; iron car wheels, $26.50, and several sales of rails for rolling are noted at $26 and $26.50. These prices noted in actual transactions record advances of 50 cents to $1 per ton over last week's quotations.

Those in touch with the situation explain the present acute shortage of scrap by calling attention to the fact that while the average life of steel from furnace to furnace is seven years, millions of tons were shipped abroad for several years subsequent to 1914 from which there has been and will be little or no scrap returned.

Buying in Small Lots

Cleveland, Feb. 20.—Strength of the iron and steel scrap market continues in the Cleveland district. New buying is confined to small lots fairly well distributed among the various grades. Heavy melting steel, turnings, malleable and cast are in greatest demand, although one consumer here within the past few days ordered shipments held up because deliveries have come through with such regularity that it became necessary to dump a large quantity on ground when plant sidings became congested. While some users are in need of scrap they are disinclined to buy in quantity in that they regard prices too high. In fact it is the general belief the crest of the present market movement has about been reached. Heavy melting steel is up

(Concluded on Page 575)

Semifinished Advancing

Higher Prices Paid for Sheet Bars and Billets—Severe Shortage Still Prevails—Wire Rods Bringing $50

SEMIFINISHED STEEL PRICES, PAGE 556

Youngstown, O., Feb. 20.—A free supply of 15,000 tons or more of sheet bars would be required to satisfy current inquiry for this commodity before producers in this district. While the last known sale of sheet bars involving about 200 tons was consummated at $40, Youngstown, a firm offer of $42, Youngstown, for approximately 2000 tons appeared this week. It is understood that a mill in another district which is in a position to consider sheet bar business is quoting a minimum of $42, Pittsburgh. Two large producers of sheets whose plants are equipped for rolling sheet bars, are seeking tonnage on the outside but hesitate to close in view of present semifinished quotations prohibiting a profit on the finished product. It is understood a maker of low-priced automobiles is endeavoring to purchase sheet bars for conversion at certain sheet mills where schedules permit the rolling of additional tonnage. Producers of semifinished here have no tonnage to offer at the moment and in one case it is likely that a large amount of scheduled business will be carried over into the next quarter.

Seek Tonnages at Cleveland

Cleveland Feb. 20.—Urgent inquiry for sheet bars and billets received here in the past week aggregate 20,000 tons, and offers over $40 have been made for sheet bars. Slabs do not figure in current inquiry to any great extent. The leading maker in this district is fully committed for the first quarter, and is not booking business for the second.

Wire Rods in Strong Demand

New York, Feb. 20.—Considerable tonnage of semifinished steel is under demand here. The pressure is keenest for wire rods. While the minimum price on wire rods now is $47 base Pittsburgh, most tonnages are bringing $50. One tonnage just has been sold for export to Japan at $55 base Pittsburgh. Included in current inquires for billets are several thousand tons of rerollers and a lot of 500 to 1000 tons of forging billets for the American Locomotive Co. The price on rerolling billets, either bessemer or open hearth, now is $40 base Pittsburgh. It now is difficult to buy forging billets under $47.50 base Pittsburgh. An eastern consumer is in the market for sheet bars for delivery at the rate of at least several hundred tons a month. The minimum on sheet bars appears to be $40 base Pittsburgh.

Warehouse Steel Still in Heavy Demand

WAREHOUSE PRICES, PAGE 616

Cleveland, Feb. 20.—The local warehouse market is unchanged from a week ago. Demand continues heavy, coming from regular buyers as well as usual mill consumers who have been unable to obtain sufficient tonnages at desired deliveries from mills. Prices are strong at the established levels and higher quotations are anticipated in view of the advances from mills. Stocks, while not depleted, still are not large and at least one interest has been compelled to turn away considerable business due to the lack of material.

Price Advances Expected

New York, Feb. 20.—Iron and steel products out of warehouse are strong with further price advances in shapes, plates, and steel bars expected shortly. It is likely several other items also will be affected. Demand, while not as heavy as in the Middle West, is active, and is becoming more so as time goes on. Shapes and steel bars are in heaviest demand at present.

Prices Are Unchanged

Philadelphia, Feb. 20.—Iron and steel jobbers here report demand is fully 100 per cent of what is considered normal business. Prices are unchanged and firm.

Cold Rolled is Advancing

Chicago, Feb. 20.—Cold-rolled strip steel and cold-rolled flat wire have been advanced $5 per ton by Chicago warehouses from $6.65 to $6.90 and

chain proof coil from $7.60 to $7.85 per 100 pounds. Demand for steel from store is increasing and as mill deliveries continue backward more and more is being required of warehouses.

Tin Plate Buyers

Make Intermittent Purchases to Fill Out Needs—Consumption Heavy

TIN PLATE PRICES, PAGE 556

Pittsburgh, Feb. 20.—Intermittent purchases of tin plate continue to be made by makers of packers' cans and other tin plate consumers who find they have not fully covered requirements. Some buyers instead of placing a contract and then waiting an indefinite period to file specifications have made the contract papers include the actual specifications. Except as operations are interrupted from time to time by steel, labor and car shortages, production continues on an even keel and while in some cases shipments have to be held at points of production because of embargoes and curtailed car supplies, actual shipments for the month, no doubt, will be large. In fact, it is anticipated a heavy shipping rate will be maintaned all through the summer and well into the fall. The market price continues unchanged at $4.75 per base box of 100 pounds, Pittsburgh.

Consumption is Heavy

New York, Feb. 20.—Tin plate consumption is heavier than expected and a number of consumers in this district are endeavoring to place additional tonnages for the first half. In some instances mills are refusing to quote because of their sold-up condition. There is a heavy demand for stock tin plate. In most instances this is bringing $4.75 per base box Pittsburgh although some of this business is going at $4.50.

To Enlarge Plant

Chicago, Feb. 20.—Further enlargement of its No. 2 plant at Indiana Harbor, Ind., is planned by Inland Steel Co., although plans have not yet been carried to a sufficiently definite point for announcement. An addition to the open hearth plant and some additional mill capacity will be built, involving about 12,000 tons of structural material to house the new equipment. This will make the No. 2 plant on the lake shore the largest part of the Indiana Harbor Works of this company.

More Iron Is Imported

Philadelphia, Feb. 20.—Imports of pig iron at this port in the week ended Feb. 17 totaled 6015 tons. Of this amount, Germany contributed 459 tons, France 2732, England 300 and Nova Scotia 2524. Iron ore imports were 15,459 tons, 7809 coming from Sweden and 7650 from French Africa. Two tons of manganese ore was imported from Germany and 4500 tons of chrome ore from South Africa.

The New Process File Co. of Newcastle, Ind., has filed a preliminary certificate of dissolution.

Sheet Output Hampered

Car Shortage May Force Closing of Additional Mills—Price Spread Widens—Foreign Demand Improves

SHEET PRICES, PAGE 556

Youngstown, O., Feb. 20.—Black sheets are about the only grade that can be purchased at mills in the Mahoning valley, but it requires considerable shopping around to place certain specifications. In view of sheet bar prices showing tendencies toward higher levels a large number of sheetmakers are of the opinion that when order books permit the taking of additional sheet tonnage, the entry figures will be higher than 2.75c for blue annealed, 3.50c for black and 4.75c for galvanized, base, Pittsburgh. Two producers early this week reported the acceptance of black tonnage at 3.60c and the refusal of substantial tonnages of galvanized at 4.75c, Pittsburgh. Consumers continue to submit inquiries for black and galvanized in 300 to 500-ton lots. The Standard Oil Co. is seeking approximately 500 tons of oil drum stock in gages between 18 and 22. Conditions in the sheet market here have reached the stage where it is becoming increasingly difficult to buy in less than carload lots, long established customers excepted. Consumers in the lake districts report that certain mills frequently seek the release of specifications for black against contracts, indicating that gaps in rolling schedules still exist. No floating labor is current at sheet mills in this district now and operation of pickling and galvanizing departments is becoming more difficult right along. Shipments, however, are reported satisfactory. A large producer of automobiles in the Detroit district whose stock of sheets seldom is in excess of a 30-day run, now is seeking tonnage actively but as far as can be ascertained, has not been successful in lining up a supply near his requirement.

Difficulties Are Increasing

Pittsburgh, Feb. 20.—Difficulties of sheet production and shipment are increasing. Sheet bar supplies which in the case of some conversion mills promises to show improvement this week still are far from satisfactory; intermittent labor shortages, particularly in pickling departments, promise to continue on an increasing scale as spring and summer advance bringing more attractive outside work. Car shortages are acute, so much so that unless relief comes this week several mills including two or three of the American Sheet & Tin Plate Co. will be compelled to shut down. Indicative of the keen desire of sheet customers to get their specifications written on the books, one buyer which closed on 500 tons of automobile sheets late last week for delivery in the last half of June promised to file his specifications not later than today. The demand from domestic consumers not only is heavy but promises to continue so for many months based on consumption requirements already in sight. Demand from abroad likewise continues to improve since German, French and Belgian sources of supply are considered unreliable and the business ordinarily going in those directions is being offered to American producers at exceedingly attractive prices. Price spreads in the domestic market continue to widen. The American Sheet & Tin Plate Co.'s figures of 2.50c, 3.35c, 4.35c and 4.70c, base Pittsburgh, on blue annealed, black, galvanized, and full-finished automobile sheets, respectively, continue to apply for the second quarter while independent makers generally are naming figures far in advance of those bases. Up to 3.60c is noted in black; up to 4.75c in galvanized, with several galvanizing departments down entirely; up to 2.85c and 2.90c is quoted on blue annealed in single carloads; while up to 5.25c has been quoted on full finished automobile sheets.

Second Quarter Sheets Covered

Chicago, Feb. 20.—Inland Steel Co. has apportioned its second quarter production of steel sheets among its regular customers in proportion to their relative needs. Except for formal entering of the contracts, its entire tonnage to the middle of the year has been covered and it will be out of the market for about three months. The prices on which this business was divided are 2.60c, Pittsburgh, for blue annealed, 3.35c and 4.35c, Pittsburgh, for black and galvanized respectively. The former represents an advance of $2 per ton over first quarter price, while the latter are unchanged.

Eastern Demand Increasing

New York, Feb. 20.—Demand for sheets is increasing and prices are moving up. Consumers are inquiring for second quarter contracts in many cases and while some second quarter business is being booked, some of the mills are holding up action, since they are inclined to expect higher prices on second quarter. At the present time the minimum on blue annealed sheets with independents is 2.75c base Pittsburgh, although the market is tending toward 2.90c. Black sheets still can be had at 3.50c, base Pittsburgh, but the price is tending toward 3.60c. Galvanized sheets still can be had at 4.50c but much of the business is going at 4.75c.

Sheet Prices Higher

Philadelphia, Feb. 20.—Sheet prices are advancing. Blue annealed is still 2.75c, Pittsburgh, but there is an increasing amount of business at 2.90c. Some makers quoted 3.00c in the past week. Black sheets generally are 3.50c, but some makers are now asking 3.60c as minimum and 3.65c is quoted on some business. Galvanized sheets still are going at 4.50c, but the market is tending toward 4.75c. A good deal of second quarter inquiry is noted. Some is being closed where consumers' necessities dictate, but the mills generally expect higher prices and hence are holding off.

Structural Prices Advance

Awards During Week Total Over 26,000 Tons Following Slump in Previous Week—Minimum Price Now 2.25c, Pittsburgh

STRUCTURAL SHAPE PRICES, PAGE 556

Washington, Feb. 20.—The increase in sales of fabricated structural steel begun in December was continued in January with the largest bookings since last May, according to reports received by the bureau of census. Sales reported by 147 companies with a capacity of 218,645 tons per month amounted to 164,404 tons, or 75.2 per cent of shop capacity, as compared with 57.8 per cent of shop capacity reported for December. The following table compares reports of 158 identical companies with a capacity of 220,690 tons per month from April through October, while later reports are based on a varying number of companies with little change in total capacity. Earlier figures are based on reports received by the Bridge Builders and Structural society. For comparative purposes each month's figures are prorated to obtain an estimated total for the country on a capacity of 250,000 tons.

Monthly structural awards as reported by the bureau of census are as follows:

	Actual bookings, tons	Per cent of capacity	Estimated total bookings, tons
January, 1923....	164,404‡	75.2	188,000
December	128,439†	57.8	144,500
November	107,709*	48.4	121,000
October	126,535	57.3	143,300
September	141,418	64.1	160,300
August	150,700	68.3	170,800
July	152,023	68.9	172,300
June	162,139	73.4	183,500
May	180,558	81.8	204,500
April	198,529	89.9	224,800
March	139,300	77.0	192,500**
February	78,700	43.5	108,750**
January, 1922....	72,100	40.0	100,000**

‡Reported by 161 companies. †Reported by 159 companies. *Reported by 147 companies. **Figures of Bridge Builders and Structural society revised on basis of 250,000 tons capacity.

Premiums on Nearby Shipments

New York, Feb. 20.—Structural demand is heavy, with nine projects involving more than 50,000 tons either on the point of being brought out or scheduled to be within the next four weeks. The largest project calls for 18,000 tons for the Presbyterian hospital, this city, Mark Eidletz being the general contractor.

Outstanding awards include 3000 tons for the Olympic hotel, Seattle, placed through George P. Post, New York; 2300 tons for a plant addition for the American Type Foundries, Elizabeth, N. J.; and 2100 tons for building at Columbia university. Shape prices continue upward, with the market holding at 2.20c to 2.25c, Pittsburgh, although nearer the outside figure, and premiums of 10 points and higher being paid for nearby shipments. Deliveries generally are around 12 to 14 weeks.

More Business at Higher Prices

Philadelphia, Feb. 20.—It is difficult to place shape tonnage owing to the booked up condition of mills. Eastern makers are having difficulty increasing their output largely on account of the labor shortage. A price of 2.25c, base Pittsburgh, now is the minimum with independents. An increasing proportion of business is being done at 2.35c and in some cases 2.50, Pittsburgh, is quoted. A leading interest is asking 2.20c, Pittsburgh, but this maker has quoted 2.25c in numerous cases. Considerable structural business is expected to come out shortly.

Purchase Shapes for Stock

Pittsburgh, Feb. 20.—Various lots of structural shapes which in the aggregate represent a sizable tonnage have been purchased by fabricators from the mills for their stocks. In this they have been particularly active of late, evidently believing that the market will continue to advance and they see no letup in consumptive demand for some time to come. Definite awards for the week in the Pittsburgh area are confined to relatively unimportant tonnages. Considerable work is contemplated, however although the majority of projects involve lots of steel below 500 tons each, including many schools. Fabricators' shops generally are filled up for at least two months to come. This is particularly true of the American Bridge Co. which has been the recipient of several large jobs from different sections in the past month. The market on structural shapes is quotable at 2.20c, base Pittsburgh, and up.

Inquiries Total Large

Boston, Feb. 20.—Structural demand is so great that it is beyond the ability of the mills to ship the material. The majority of sales are being made at 2.25c, Pittsburgh. Contracts placed during the week totaled over 1100 tons while new inquiries reached a total of 6500 tons.

Little Business Is Expected

Cleveland, Feb. 20.—Structural awards again passed a week of little activity after showing a gain during the week preceding. Practically the only award in this immediate vicinity was 125 tons for a boiler house for the Otis Steel Co., Cleveland, this tonnage going to the Fort Pitt Bridge Works. New inquiries for the week were few and were for small lots with the exception of a power station for the Ohio Power Co., at Philo, O., this project calling for approximately 2000 tons. The impression seems to exist that little business of sizable volume will come out in this district in the near future. A price of 2.25c, base Pittsburgh, on plain shapes has replaced the quotation of 2.20c.

Big Buying in Prospect

Chicago, Feb. 20.—In spite of the large tonnage of structural material already bought this year and the continuance of new business, no break has appeared in demand and a heavy tonnage remains to be placed. Bids are still under consideration for the Stevens hotel here, which will require 17,000 tons. Lettings during the past week run fairly high, with much of the tonnage for railroad bridge work and other bridges for local government bodies. In fact, the bridge tonnage of the past week represents practically all the contracts placed. Inland Steel Co. has allocated its structural tonnage for second quarter on the basis of 2.40c, Chicago mill, while the leading interest continues to book for delivery at mill convenience at 2.35c, Chicago mill.

CONTRACTS PLACED

- ward reported this week..... 26,869 tons
Awards reported last week..... 20,430 tons
Awards reported two weeks ago.... 31,773 tons

6000 tons, Packard building, Philadelphia, to Bethlehem Steel Bridge Corp.

3000 tons, hotel Olympic, Seattle, Wash., placed through George P. Post, New York, to American Bridge Co.

2700 tons, office building, Broadway and Liberty street, New York, to Levering & Garrigues.

2500 tons, exchange for Bell Telephone Co. of Canada, Toronto, Ont., bids asked.

2300 tons, plant addition for the American Pipe Foundries, Elizabeth, N. J., to McClintic-Marshall Co.

1600 tons of which 1000 is for a business building and 600 for the Women's residence hall, Columbia university, New York City, to the Hinkle Iron Works.

1400 tons, Roth Fur building, Seventh and West Twenty-ninth street, New York, to Heddon Iron Construction Co.

1200 tons, Garland building, Los Angeles, to American Bridge Co.

1166 tons, truss spans, girder spans and turntables for Chicago, Burlington & Quincy railroad, to American Bridge Co.

600 tons, Central Finance building, Los Angeles, to Llewellyn Iron Works.

600 tons, mill building for Russell, Birdsall & Ward Bolt & Nut Co., Port Chester, N. Y., American Bridge.

500 tons, Phoenix National bank, Hartford, Conn., placed through Mark Eidletz, general contractor, to Levering & Garrigues.

500 tons, Teachers college, Columbia University, New York, to Heddon Iron Construction Co.

500 tons, Beverly high school, Boston; fabricator not named.

490 tons, Dorchester high school, Boston; fabricator not named.

400 tons, Spaulding office building, Ann and Nassau streets, New York, to Harris Structural Steel Co.

400 tons for locomotive erecting and boiler shop for Union Pacific railroad, Los Angeles, Cal., to McClintic-Marshall.

400 tons, shop building for Westinghouse Lamp Co., Belleville, N. J., to Lehigh Structural Steel Co.

400 tons, apartment, Ninety-seventh street, to Lehigh Structural Steel Co.

300 tons, bridge for New York Central railroad, to Shoemaker-Satterthwait Bridge Co.

300 tons, girder work for the Minneapolis & St. Paul railroad, to McClintic-Marshall Co.

300 tons, show room for Middlesex Motors, London, Ont., to H. C. Lefroy Engineering Co., Toronto, Ont.

300 tons, factory building, Shelbyville, Ind., to Central States Bridge Co.

270 tons, Eagle river bridge, Alaska, to American Bridge Co.

260 tons, high school, Freeport, L. I., to Lehigh Structural Steel Co.

260 tons, Willis-Eglehoff apartment, Ninety-third street, New York, to Lehigh Structural Steel Co.

250 tons, loft building, Ninth avenue and Fourteenth street, New York, to Lehigh Structural Steel Co.

250 tons, viaduct, Public Service Corp., Newark, N. J., to American Bridge.

246 tons for eight 60-foot and one 40-foot deck plate girder spans, various locations, for Chicago & Northwestern railroad, to American Bridge Co.

225 tons, building for First National Bank, Flint, Mich., to Flint Structural Steel Co.

216 tons for bridge at Crookston, Minn., for state of Minnesota, to American Bridge Co.

200 tons for the Forest Park school, Baltimore, to Curtis Bay Co.

200 tons, gas holder, city of Ypsilanti, Mich., to Stacey Mfg. Co.

200 tons for the United Electric Light & Power Co., Dunwoodie, N. Y., to Heddon Iron Construction Co.

195 tons, junior high school, Chisholm, Minn., to American Bridge Co.

150 tons, Gillette building, Boston; fabricator not named.

150 tons, power station, Pine Grove, Pa., to Lehigh Structural Steel Co.

150 tons, highway bridges for Mahaska and Delaware counties, Iowa, at Oskaloosa, Iowa, and Manchester, Iowa, to unknown fabricator.

134 tons, Humptulips river bridge, Washington, to Shoemaker-Satterthwaite Bridge Co.

132 tons for two 77-foot 6-inch deck plate girder spans, Caldwell, Kans., to American Bridge Co.
125 tons, boiler house for Otis Steel Co., Cleveland, to Fort Pitt Bridge Works.
100 tons, Eighty-second street bridge, Chicago, for Nickel Plate railroad, to American Bridge Co.
100 tons, First National Bank building, York, Pa., to Chesapeake Iron Works.
100 tons, transmission towers for Phoenix Utilities Co. for Kansas, to Lehigh Structural Steel Co.
100 tons, substation, Siegfred, Pa., to Lehigh Structural Steel Co.

CONTRACTS PENDING

18,000 tons, Presbyterian hospital, New York; Mark Eidletz, general contractor, to issue specifications shortly.
15,000 tons, two office buildings and two apartments in Grand Central Terminal zone, New York; preliminary specifications being figured.
8000 tons, office building for William Randolph Hearst, New York; specifications out soon.
6000 tons, Pennsylvania Co. building, Fifteenth and Chestnut, Philadelphia; pending. Thompson-Starrett Co., general contractor. Steel to be awarded this week.
6000 tons, North American insurance building, Philadelphia; bids asked. Stone & Webster, general contractors.
3500 tons, Los Angeles chamber of commerce building, Los Angeles; pending.
3000 tons, Savoy hotel, New York; specifications out shortly.
3000 to 4000 tons, apartment, J. G. White Engineering Co., New York; specifications out soon.
2000 tons, Lincoln drive apartment, Philadelphia; pending.
2000 tons, apartment for Dwight P. Robinson Co., New York; specifications out within the next week or 10 days.
2000 tons, power plant, Ohio Power Co., Philo, O.; bids being taken.
1500 tons, group of apartments at Astoria, L. I.; bids asked.
1200 tons, warehouse, Van Dam street, New York; bids asked.
1000 tons, York state highway bridge; pending.
870 tons, Bank of Buffalo building, Buffalo, N. Y.; bids in.
1000 tons, loft in West Thirty-seventh street, New York; bids asked.
1000 tons, apartment, 1150 Fifth avenue, New York; bids asked.
800 tons, public school No. 69, New York; pending.
800 tons, East End hospital, New York; bids asked.
700 tons, building for Institution of Blind, New York; pending.
600 tons, hotel, Philadelphia; pending.
500 tons, high school, Geneva, N. Y.; pending.
500 tons, Lion Brewery, New York; bids asked.
500 tons, first of 3000 tons for power house, South Weymouth, Mass.; bids asked. Stone & Webster, general contractors.
500 tons, building for Trumbull Savings & Loan Co., Warren, O.; redesigned and new bids to be asked.
450 tons, Moccasin creek power house, San Francisco; pending.
400 tons, Y. M. C. A. building, Orange, N. J.; bids asked.
350 tons, civic auditorium, Stockton, Cal.; bids open March 20.
300 tons, plant addition for American Locomotive Co., Paterson, N. J.; pending.
300 tons, alterations to schools No. 12 and No. 33, New York; pending.
300 tons, building addition for Fraternal Order of Eagles, Lorain, O.; bids asked.
200 tons, Community building, Ozone Park, L. I.; pending.
100 tons, bridge near Portersville, N. Y.; bids in.
100 tons, grandstand for Cranwood Driving Park, Cleveland; bids in.

Ore Output Increasing

Duluth, Feb. 20.—Mining operations on the Minnesota ranges have been increased by all operators and the scarcity of experienced miners is proving a handicap. Large stock piles are ready for shipment when navigation opens. The Minnesota Steel Co.'s blast furnaces, open-hearth furnaces and wire mill at Duluth are operating at capacity.

The Pittsfield Electric Co., Pittsfield, Mass., is to increase its capital stock from $875,000 to $1,000,000 for improvements.

Locomotive Awards High

Pennsylvania Places Additional Order for 200—Car Buying Still Light but Better Than Week Ago—Rails Are Weak

RAILROAD TRACK MATERIAL PRICES, PAGE 556

Chicago, Feb. 20.—Practically 10,000 freight cars are represented in a new inquiry coming out during the past week, making the largest total of new business for several weeks past. Closing of purchases continues slow. This is due in large measure to the heavy order on book of car builder and to the lateness of delivery now possible to make. Spikes and bolts have been advanced $3 per ton to 3.15c for spikes and 4.15c, Chicago, for bolts. Tie plates and splice bars are unchanged. Selling of track fastenings continues at a good rate and one interest booked about 30,000 kegs of spikes and bolts during the past week, with a large tonnage of angle bars and some tie plates. Small lots of standard steel rails sold in the past week aggregate about 2000 tons. Light rail sales are steady with prospects for heavier buying in the spring.

Buying of Locomotives Continues

New York, Feb. 20.—Award of 1500 freight cars by the New York, Chicago & St. Louis is an outstanding contract in the eastern car market, with others relatively small. New inquiry is comprised principally of small lists. Locomotive buying is heavy, the leading award involving 200 locomotives for the Pennsylvania railroad and going to the Baldwin Locomotive Works. This with the 75 reported last week as going to Baldwin, makes 500 locomotives to be allocated since the first of the year. Other awards include 20 for the New York Central, 10 going to the American Locomotive Co. and 10 to the Lima Locomotive Wors; six for the New York, Ontario & Western, and two for the Cambria & Indiana, both the latter going to the American Locomotive Co. The Republic Iron & Steel Co., Youngstown, O., has placed an order for five locomotives with the Baldwin Locomotive Works; six for the New York, include 66 for the Southern; 25 for the Seaboard Air Line; 20 for the Western Maryland; 15 for the Elgin, Joliet & Eastern; and three for the Detroit, Toledo & Ironton.

Many Locomotive Inquiries

Philadelphia, Feb. 20.—Locomotive inquiries pending include 36 for the Louisville & Nashville, 66 for the Southern, 50 for the Southern Pacific 30 for the Seaboard, 10 for the Central New Jersey, 25 for the Reading, 20 for the Western Maryland, 10 to 15 for the Lehigh Valley, also an indefinite number for the Wheeling, Lake Erie and Burlington. The Reading railroad has held up action on 1000 box cars. The Interstate Railroad of Virginia placed 500 hopper cars with the Pressed Steel Car Co., and now is inquiring for four or five cabooses. The United Gas Improvement Co. awarded 150 hoppers to the American Car & Foundry Co.

Prices Remains Unchanged

Pittsburgh, Feb. 20.—Light rails rolled from billets still are quoted at 2.15c, base Pittsburgh, nothwithstanding the fact that steel products steadily are advancing. This figure is retained because the demand is not sufficiently large to justify an increase. On some orders, however, 2.25c is being quoted. Coal mining operations are not extensive and only an occasional carload or two is being bought, several such orders being noted during the past week. Specifications and large contracts are coming through regularly from different consuming lines to such makers as the Carnegie Steel Co. and others here.

Track accessory orders are not particularly heavy although specifications on contracts are. Current inquiries do not involve large amounts, only piecemeal quantities for filling in purposes being noted; 1000 kegs of spikes, 10,000 or 25,000 tie plates, 25 to 30 tons of track bolts, being more or less typical quantities. Standard spikes still are quoted at 2.90c, Pittsburgh, and small spikes at 3.50c. Tie plates now cannot be quoted at less than 2.60c or $52 per ton while up to $56 per ton is noted depending upon the quantity involved as well as the die block specifications. Quotations on track bolts likewise register a wide spread, 3.85c to 4.50c being noted, depending upon the quantity involved.

CAR ORDERS PLACED

New York, Chicago & St. Louis, 1000 hoppers to Pressed Steel Car Co., and 500 gondolas to Standard Steel Car Co.
New Jersey, Indiana & Illinois, 150 automobile cars, to American Car & Foundry Co.
Union Pacific, 10 horse cars, to American Car & Foundry Co.
Nickel Plate railroad, 500 gondolas to Standard Steel Car Co. and 1000 composite hoppers to the Pressed Steel Car Co.
Verde Tunnel & Smelter railway, 50 gondolas; pending.
Elgin, Joliet & Eastern, 200 hopper cars, to unnamed builder.

CAR ORDERS PENDING

Southern railroad, 2000 box, 1000 hoppers, 1000 gondolas, 200 stock cars and five coaches and 1600 steel underframes; bids asked.
Texas Co., 300 tank cars; bids asked.
St. Louis & San Francisco railroad, 100 car bodies; bids asked.
Fruit Growers Express, 2000 underframes; bids asked.
Southern Pacific railroad, 150 passenger cars; bids asked.
Atchison, Topeka & Santa Fe railroad, 100 tank cars; bids asked.
Tidewater Oil Co., 125 tank cars; bids asked.
Illinois Central, 500 automobile cars; pending.
Union Carbide Co., five gondolas; pending.
Michigan Central, 50 to 100 gondolas; pending.

Chicago Operations Hold

Chicago, Feb. 20.—Steel production in the Chicago district is unchanged. Illinois Steel Co. has been forced to bank one blast furnace at South Works on account of difficulties with fuel and lack of sufficient labor. It is expected this will be returned to blast at any time. This interest continues production at about 83 per cent capacity. Inland Steel Co. is producing at 75 to 80 per cent of capacity. Other mills are doing as well as fuel and labor conditions will allow and all are pushing production to the highest point possible.

Building Bars in Demand

After Week of Quietness, Contracts Placed Show Some Improvement—Inquiries in Better Volume and for Large Tonnages

REINFORCING PRICES, PAGE 556

Cleveland, Feb. 20.—Placing of reinforcing bar business was somewhat better during the past week than for several weeks past. At the same time inquiries appeared to be in better volume, leading to the belief that business in this vicinity may approach a more normal basis in the next two or three weeks. Considerable business has been pending for some time although only small tonnages are represented in each. Much of this is likely to be closed soon. One interest placed over 1000 tons on its books during the last week, the best it has been able to do for several weeks. Rail steel bars continue to be quoted at from 2.00c, to 2.10c, base Pittsburgh, while bars from new steel remain at 2.10c to 2.20c, base Pittsburgh, most of the business being confined to the 2.15c to 2.20c range.

Sharp Lull In Buying

Chicago, Feb. 20.—Buying of reinforcing bars is in sharp contrast to the heavy tonnages booked a fortnight ago, although a fair total still continues to be taken by sellers. An order for 1250 tons for extensions of the Studebaker Corp. is conspicuous. Projects pending involve a large tonnage of bars and a revival of activity is expected shortly in order that the buildings may be started early in the spring. Supply of bars is rather uncertain as to delivery on account of the heavy bookings already made. Under the circumstances prices are firm and 2.75c, Chicago warehouse, represents the present level. Some sellers are inclined to raise this and believe 3.00c, Chicago warehouse, will prevail within a short time.

Several Thousand Tons Pending

Pittsburgh, Feb. 20.—More concrete bar work is pending in the Pittsburgh district than at any time in the past several months. This amounts to several thousand tons and no doubt will increase as spring advances. Awards have been few and since the 400-ton lot for the Pittsburgh Meter Co. building went to the Concrete Steel Co., the tonnages involved in individual projects have been for the most part for less than carload quantities. Some of the larger jobs now current are as follows: A high school at Monongahela, Pa., a silk mill at Shingle House, Pa., a bank and office building at Huntington, W. Va., department store at Greenburg, Pa., commercial garage at Huntington, W. Va., and several schools including a high school and grade school at Parnasius, Pa., grade schools in Independence township and Rennerdale, Pa.; as well as one or two local schools. The Prahl Construction Co., Erie, Pa., is low bidder on the high school at Ellwood City, Pa. About 370 tons of concrete bars will be purchased this week by the H. B. Conveyse Co., Boston, for the Fortieth street bridge, Pittsburgh. From 2.15c to 2.50c, base Pittsburgh, represents the spread of quotations in the market, 2.10c being entirely nominal with both 2.15c and 2.20c fast becoming so; the 2.25c figure really is more general.

CONTRACTS PLACED

Awards reported this week..... 3,825 tons
Awards reported last week ..... 1,225 tons
Awards reported two weeks ago ..13,602 tons

1250 tons, addition to plant of the Studebaker Corp., South Bend, Ind., to Kalman Steel Co.
400 tons, American Lake hospital, Seattle, to Pacific Coast Steel Co.
400 tons, Pittsburgh Meter Co. building, Pittsburgh, to the Concrete Steel Co.
325 tons, building for General Fire Extinguisher Co., Warren, O., to Concrete Steel Co.
300 tons, Illinois Central railroad, various locations, to Kalman Steel Co.
250 tons, building for Libbey-Owens Co., Fairmount, W. Va., to Concrete Steel Co.
250 tons, building for the Kellogg Co., Battle Creek, Mich., to Corrugated Bar Co.
200 tons, Illinois Central construction at Fulton, Ky., to Corrugated Bar Co.
200 tons, Finch-McConnell Co., St. Paul, to C. A. P. Turner, Minneapolis.
150 tons, highway work in Wisconsin, to Corrugated Bar Co.
100 tons, county highway work in Wisconsin, to Corrugated Bar Co.

CONTRACTS PENDING

1300 tons, Olympic hotel, Seattle; pending.
400 tons, bank and office building, Union Savings bank, Huntington, W. Va.; bids close April 1.
200 tons, silk mill, three buildings at Shingle House, Pa.; bids close Feb. 24.
200 tons, high school, Monongahela, Pa.; bids being taken.
200 tons, sales and service building, Studebaker Corp. of America, Euclid avenue, Cleveland; bids out soon.
150 tons, department store, A. E. Troutman Co., Greensburg, Pa.; bids being taken.
150 tons, Ellwood City, Pa., school; Prahl Construction Co., Erie, Pa., low bidder.
150 tons, commercial garage, Motor Sales Co., Huntington, W. Va.; bids close Feb. 24.
125 tons, for Pettit Storage Warehouse, Ft. Wayne, Ind.; bids in.
110 tons, Union high school, Grand Rapids, Mich.; bids asked.
100 tons, school, Massilon, O.; bids asked.
100 tons, warehouse United States Casket Co., North Side, Pittsburgh; bids closed Feb. 21.
Tonnage not stated, building for W. S. Tyler Co., Cleveland; bids asked.
Tonnage not stated, storage warehouse for Lincoln Fireproof Storage Co., Cleveland. Geo. A. Rutherford Co., general contractor.

Pipe Orders

Declined as Demand Continues Heavy —Users Seek Early Shipments

PIPE PRICES, PAGE 556 AND 620

Pittsburgh, Feb. 20.—Pressure in increasing measure is being brought to bear upon tubular goods producers for deliveries. Shipments on orders placed in January are being asked and makers are being besieged not only to hurry deliveries but to accept more tonnage. Not only is this true of jobbers and users generally in connection with standard full-weight merchant pipe but in connection with oil country goods, line pipe, etc. Pipe producers generally are so filled up they discourage buying and in some cases have declined proffered business. This is particularly true of orders for oil country goods, line pipe, etc. Eastern and southern jobbers supplying numerous oil country goods are peddling large tonnages but as much is being turned down by makers as is being accepted. One line pipe producer turned down an aggregate of 300 miles of different sizes and different lengths of lines within a week recently. Operations among Pennsylvania, Ohio and West Virginia oil well drillers were interferred with somewhat by a gas shortage last week, but this is not deterring their efforts to buy tubular goods. All are anticipating spring and summer needs. The card discounts of Feb. 1-3 are firm with one to 3-inch black standard full weight merchant pipe at 64 off and galvanized at 52½ off. The card discount on line pipe of Feb. 1-3, 2½ to 6-inch lapweld, is 59½ off.

City Buying is in Lull

Chicago, Feb. 20.—Relatively little inquiry and buying of cast iron pipe is being done at present, previous buying being for the most part tonnage left over from last year's requirements. The 1923 programs have not yet been outlined and this buying is not expected for several weeks. A contractor's letting for 100 tons at Marengo, Ill., has not been placed with a maker. The Lynchburg Foundry Co. has been awarded 800 tons at Elmwood Park, Ill., a suburb of Chicago. Most makers have full order books and are not seeking business actively. Prices are steady and firm.

Lettings Still Being Received

Birmingham, Ala., Feb. 19.—Cast iron pipe plants here still are receiving lettings and the outlook for operations is encouraging. Contracts come from the Middle West, from the West and the Southwest. Consumers are responding to the request for instructions as to shipments of pipe bought during the first part of the winter and as railroad service improves the traffic in cast iron pipe, pressure pipe in particular, is being increased. Much attenton is being attracted to the production of pressure cast iron pipe by the deLavaud method and engineers in various sections of the country are accepting that class of pipe.

Soil or sanitary pipe and fittings, cast iron pipe, are also in strong demand and much business has been placed. The Southern Sewer Pipe Co. will take back its plant at North Birmingham leased to the McWane Cast Iron Pipe Co. and March 1 will return to sanitary pipe making. The McWane company is rushing to completion its new plant in East Birmingham where pipe ranging from 1¼ to 6 inches will be manufactured. The company has a large order book.

Activity Is Noted

New York, Feb. 20.—Award of 1000 tons of cast iron pipe for Wareren, Mass., has gone to the Warren Foundry & Pipe Co., and the generol contract involving 800 to 900 tons for Staten island has been placed with the De Fano Contracting Co., which is expected to close on the pipe shortly. The market generally is active, and this, in conjunction with advancing quotations in pig iron, is expected to make for another increase in prices shortly.

Wire and Nail

Demand is Largest in History—Makers Booked Far Into Future

WIRE PRICES, PAGE 556

New York, Feb. 20.—Business in wire and nails in January and February has been entered in the heaviest volume in the history of the business. The daily average total bookings are well in excess of the previous record established during the boom period in 1920. The mills are alarmed at the way their order books are being swamped and now are calling a halt on new business. In fact, they are beginning to exact assurances before booking any additional tonnage that the material will be needed at the time specified for definite work. All the mills are sold for 90 to 120 days ahead at the present rate of output which varies from 75 to 90 per cent for the various mills. The leading interest has advanced its price to 2.80c base Pittsburgh for nails and 2.65c for plain wire. The minimum with the independents on nails now is 2.90c, although these interests are quoting 2.65c on wire. One independent in order to discourage business is quoting 3.00c on nails and 2.75c on wire.

Demand is Large

Buffalo, Feb. 20.—Business in wire and nails is good with local makers. Jobbers are buying in large quantities. One of the factors making for good business is the extensive road-building program in California and other coast states. Electrical welded road material is going out of here in heavy tonnage for that work. Roadwork in New York and Pennsylvania is extensive.

Nails Difficult To Buy

Chicago, Feb. 20.—A strong situation continues in the wire and nail market with heavy demand and much business being turned down by mills. New business is being taken only in proportion to the usual buying of customers and also with a view to present wire production. Shipments are being made heavily, but without effect on the backlog. Some important producers have business on books to cover production for at least three months. Specifications for barbed wire are heavier as spring approaches. Demand for nails is increasing as the building season comes nearer. Inquiry for poultry netting and various types of fencing continues, but makers are sold up and can not take on more business. Plain wire now is quoted 2.65c, Pittsburgh, and nails and annealed wire 2.80c, Pittsburgh.

Strip Prices Are Firm

STRIP PRICES, PAGE 556

Pittsburgh, Feb. 20.—New prices on hot and cold-rolled strip steel, minimums of 2.90c and 4.75c, base Pittsburgh, respectively, are firm on new business. Some orders now are being booked for delivery in the second quarter but makers are not openly soliciting them. Numerous buyers are assiduously seeking to place business for delivery during April, May and June and numerous inquiries are before large producers. One or two makers are not inclined to quote on these, not having formally opened their books for the second quarter, and when the buyers fail to place such allotments they seek to double up the unfilled portions of their first quarter contracts. Specifications are coming from diversified consuming lines and strip mill operating rates are high, 80 to 90 per cent being the general average. One plant resumed this week after a shut-down of several days because of a car shortage. While the car supply has improved somewhat, there still is much room for betterment. All are experiencing intermittent labor and steel shortages.

The Nonferrous Metals

Copper Goes Up Rapidly and Products Go Along, With Heavy Buying—Zinc Strong on Exports—Tin Up

	Copper Electro delivered	Copper Lake delivered	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Feb. 14....	15.25	15.37½	41.00	8.10	7.17½	23.00	7.12½	28.00
Feb. 15....	15.25	15.37½	41.25	8.12½	7.20	23.00	7.12½	28.00
Feb. 16....	15.50	15.62½	42.50	8.12½	7.25	24.00	7.12½	28.00
Feb. 19....	16.00	16.12½	42.87½	8.12½	7.30	24.00	7.12½	28.00
Feb. 20....	16.06	16.20	42.75	8.12½	7.35	24.25	7.25	28.00

†Outside market quotation.

NEW YORK, Feb. 20.—All nonferrous metal prices and most metal products prices have advanced rapidly the past week in active markets. Quotations now are at the highest levels since the autumn of 1920. The high rate of consumption in American industry is putting up the world markets, especially as foreign production continues curtailed by economic and political causes.

Copper quotations advanced 1c a pound from 15c as of Feb. 9 to 16c, delivered, as of Feb. 19. Copper products base prices have advanced about 1¼c in the same period. Disappearance of war stocks of scrap held by consumers is one factor and heavy demand for the building and automotive trades is another factor. Foreign demand has been only fair. January shipments of copper were estimated at 210,000,000 pounds, a figure rarely equaled in peace times. Casting copper has advanced to 15.75c refinery as of Feb. 19, or only ⅛ under electrolytic when it first reached that figure. Foundries have been exceptionally active.

Heavy export purchases of zinc for shipments over the next three or four months have caused a stiffening in zinc prices, both prompt and futures. Prime western was held Feb. 20 at 7.35c, East St. Louis, for February shipment, and at close to this figure for shipments the next few months. Domestic demand has been relatively light. High grade zinc has been selling at 8.25c, delivered.

Tin prices have advanced about 2c a pound in the past week, to 43c for spot and future shipment Straits, on Feb. 19. Bullish speculation has been rampant on the London metal exchange, based on heavy American buying in London and Singapore. American buying also has been heavy in the New York market, including spot lots by tin plate makers, who apparently have become short of tin. Ninety-nine per cent tin has been quoted about 1½ cents under Straits.

Lead buying has continued good, with supplies tightly held by such interests as have any. The minimum price has been 8c, East St. Louis and 8c, New York, with quotations 15 points above this level asked in the outside market.

The Aluminum Co. of America last week advanced its ingot price 1 cent to 25c for 98 to 99 per cent and to 26c for 99 per cent. Importers advanced 24c for 98 to 99 and 25c for 99 per cent. Offerings of foreign metal now are light, as the foreign producers appear to be well sold up.

Antimony has been steady at 7.12½c, duty paid, for carlots. Business has been moderately active.

Competition in the nickel market has been keen, with sales of shot and ingot made by outside sellers as low as 25c. The International Nickel Co. has maintained 29c for shot and ingot and 32c for electrolytic.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled 24 oz., min.	23.75
High brass	20.37½
Zinc, ga. 9 to 18 (plates ½c less)	9.00 to 9.25
Lead, full sheets (cut ¼c more)	11.25
Aluminum, base 18 ga. and up	36.40
SEAMLESS TUBES	
High brass	25.00
Copper	26.75
RODS	
High brass, round, ⅝ to 2½ inch	18.62½
Naval brass rod	20.87½
WIRE	
Copper	17.75 to 18.25
High brass	20.87½

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	10.75 to 11.25
New York	10.00 to 10.50
Chicago	10.50
HEAVY YELLOW BRASS	
New York	7.75 to 8.00
Chicago	8.25
Cleveland	8.00 to 8.50
ZINC	
New York	4.25 to 4.50
Cleveland	4.00 to 4.50
HEAVY COPPER AND WIRE	
Cleveland	13.00 to 13.50
New York	12.75 to 13.00
Chicago	12.75
RED BRASS TURNINGS	
New York	9.00 to 9.50
Cleveland	10.00 to 10.50
Chicago	9.00
YELLOW BRASS TUBING	
Cleveland	8.00 to 8.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	7.50 to 8.00
New York	7.75 to 8.00
Chicago	7.75 to 8.00
ALUMINUM BORINGS	
Cleveland	12.00 to 13.00

Seeks To Enjoin Merger with Sheet & Tube Co.

Chicago, Feb. 20.—The Allied Chemical & Dye Co. has given notice that it will apply Wednesday, February 22, to the chancellor of state of Delaware for an injunction restraining the Steel & Tube Co. of America from carrying out its agreement of sale to the Youngstown Sheet & Tube Co. and from holding a stockholders' meeting to ratify the sale.

The Allied Chemical & Dye Co. is made up of the General Chemical Co., the Barrett Co., the Semet-Solvay Co., the Solvay Process Co. and the National Aniline & Dye Co. It is a stockholder in the Steel & Tube Co. of America, acquiring its holdings through being a member of the syndicate which purchased the Iroquois blast furnace property before this was merged with the Steel & Tube Co. of America. At a recent meeting of directors of the Steel & Tube Co. of America, two directors are said to have voted in opposition to the sale and it seems probable the present action grows out of their stand.

Stockholders of the Steel & Tube Co. are scheduled to meet Feb. 28 to approve the agreement reached by the officers of the company in the sale of the properties and assets to the Youngstown Sheet & Tube Co. H. H. Springford, president of the Steel & Tube Co., in a letter to stockholders recently, said that the contract entered into provided that the Youngstown Sheet & Tube Co. assume all debts, obligations and liabilities of the Steel & Tube Co., and in addition the payment of cash equal to retire the outstanding preferred stock at $110 a share and accrued dividends and $14,509,953, being equal to $15 a share on the outstanding common capital stock. Mr. Springford also said: "Your board is of the opinion that the price to be received on the sale is a fair one and that the carrying out of the contract is in the best interests of the corporation and the stockholders. The board consequently recommends the transaction to the approval of the stockholders."

Standard Parts To Be Sold at Auction

Because of the failure of stockholders of the Standard Parts Co., Cleveland, to carry out the new financing and reorganization plan, Federal Judge D. C. Westenhaver has ordered the sale of the properties of the company at auction.

The auction will be held on March 29 in the federal court room and all sales will be subject to existing contracts. Attorney A. V. Cannon, counsel for the receiver, will be auctioneer. The sale probably will wipe out the bulk of the stockholders' interests, originally worth $20,701,831 and represented by $6,439,500 of preferred and $14,262,331 of common stock outstanding.

Claims against the company aggregate $9,754,003 of which $6,816,917 was due creditors before the appointment of Frank A. Scott and H. O. Eaton as receivers on Sept. 1, 1920. Eaton resigned in April, 1921 and Scott has continued to serve alone since that time. The company manufactures automobile axles, springs, bearings and rims. It has 11 major properties located in Cleveland, Pontiac, Mich.; Toledo and Canton, O.

Large Pipe Order Placed

New York, Feb. 20.—The Sinclair Refining Co. is reported to have allocated 93,000 tons of oil country pipe, a pipe line of 750 miles. Of this the National Tube Co., Pittsburgh, got 400 miles of 12-inch pipe and the Steel & Tube Co. of America 250 miles of 10-inch and 100 miles of 8-inch.

Will Light Furnaces

Philadelphia, Feb. 20.—It is expected the Singer Mfg. Co. will light its Musconetcong furnace at Stanhope, N. J., on foundry iron sometime in March. The Eastern Steel Co. is preparing its second Warwick furnace for operation but no date has been set for lighting.

Makers Hold Old Price

(*Concluded from Page* 561)

tion on 19 to 21 per cent material. The New Jersey Zinc Co. continues to quote $36 and $37 on single carloads of 16 to 19 per cent, and 19 to 21 per cent material, respectively.

While some quotations of $82.50, $85 and $87.50, freight allowed, still are out on 50 per cent ferrosilicon, these are nominal. Premiums as much as $2.50 per ton in excess of that maximum have been offered by consumers for prompt deliveries without sucess. The McConway & Torley Co., Pittsburgh, wants 50 tons of 50 per cent, and the Gould Coupler Co., Buffalo, wants low grade material, taking quotations on a carload each of 10 to 12 and 14 to 16 per cent material. The Allegheny Steel Co., recently was not interested in a price of $117.50 in bulk and $125.50 packed in barrels on 100 tons of 75 per cent ferrosilicon.

Blast Furnaces Resume

The Port Henry furnace of Witherbee, Sherman & Co., was lighted Feb. 12. The stack will make both foundry and malleable iron. The furnace of the Delaware River Steel Co., Chester, Pa., is scheduled to be blown in immediately on foundry iron.

Valley Operations Are on High Level

Youngstown, O., Feb. 20.—Despite the lack of steel interfering with operations at one plant and mechanical difficulty preventing full production at another, sheet mill activity throughout the Mahoning valley this week averages 89 per cent of capacity. For the first time in several months sheet mills operated by the Brier Hill Steel Co., the Republic Iron & Steel Co., the Falcon Steel Co. and the Mahoning Valley Steel Co. at Niles, O., are scheduled at maximum capacity. Of the total of 101 sheet mills engaged throughout the district, the Brier Hill Steel Co. is credited with 28, the Republic Iron & Steel Co. with 16, the Youngstown Sheet & Tube Co. with 15, the Newton Steel Co. with 13, the Trumbull Steel Co. with 9, the Falcon Steel Co. and the Mahoning Valley Steel Co. with 8 each and the Sharon Steel Hoop Co. with 4.

Steelworks' activity continues at 88 per cent of capacity for the fourth consecutive week. The Republic Iron & Steel Co. is charging 12, the Youngstown Sheet & Tube Co. 11, the Brier Hill Steel Co. 10, the Trumbull Steel Co. 7 and the Sharon Steel Hoop Co. 5.

The rate of merchant and steelworks' blast furnace operation decreased during the past few days from 86 to 82 per cent of valley capacity. The loss in this direction was due to the banking of one isolated stack because of the inability to thaw sufficient ore to keep the furnace filled. This stack however, will be placed in blast as soon as weather conditions permit. Another isolated steelwork's furnace will be blown in as soon as the management can secure a sufficient number of operators.

Tin mills scheduled this week at the Trumbull Steel Co. total 13, the same as a week ago while the strip mills of this company continue at full production. Both plate mills at the Brier Hill Steel Co.'s plant are under power, one being scheduled on skelp production. The Republic Iron & Steel Co. has seven finishing and six pipe mills and its bessemer department engaged. Miscellaneous operation at the Youngstown Sheet & Tube Co. includes 10 pipe and two merchant mills and its rod, wire and bessemer departments.

The Bay State Foundry Co., Westfield, Mass., has filed a voluntary petition in bankruptcy with liabilities of $43,814, and assets of $17,710. Theodore R. Brien, treasurer of the company, is the principal creditor for $12,084 for salary.

Scrap Figures in Basing Case

Market Practices Described at Chicago Inquiry in Pittsburgh Plus Plan To Show Law of Supply and Demand Prevails—Distribution Statistics Submitted—Steel Sellers Testify

CHICAGO, Feb. 20.—As further proof of the contention of the United States Steel Corp., in the hearing on the so-called Pittsburgh plus complaint before the federal trade commission, that the law of supply and demand fixes all prices, the situation in scrap steel was presented last week in the evidence of Joseph Michaels of the Hyman-Michaels Co. This concern has headquarters in Chicago and its transactions are practically national in scope, offices being maintained in all the principal centers of the scrap industry.

The reason for this line of testimony is that while the preponderance of steel production is in the Pittsburgh district, the larger tonnage of scrap is gathered and marketed from the Chicago district and the West. While the West consumes more steel than it produces, the Pittsburgh district consumes more scrap than it produces.

As proof of the fact that the law of supply and demand rules in both cases it was brought out through the testimony of Mr. Michaels that a parallel situation exists. Pittsburgh, consuming more than it produces, must pay a higher price for scrap than is obtained in Chicago. As the steel consumer in Chicago pays the Pittsburgh price, with some or all of the freight from Pittsburgh added, so the steelmaker in Pittsburgh pays the Chicago price on scrap with some or all the freight from Chicago added.

Figures submitted by Mr. Michaels as to the scrap industry are of much interest. He testified that of 15,000,000 to 16,000,000 tons of scrap produced and consumed annually in this country 9,500,000 to 10,000,000 tons is used in the open-hearth industry, the remainder going to foundries, rerolling mills and electric steel producers.

Assuming a north and south line through Chicago, 60 to 65 per cent of the total scrap is produced west of that line and 35 to 40 per cent east of it. Consumption is quite opposite. Only 25 per cent of the scrap is consumed west of this line and 75 per cent east of it. This results in considerable shipments from Chicago to Pittsburgh and Youngstown. On this the consumer pays the Chicago price and freight.

Fifteen years ago, Mr. Michaels said, the Pittsburgh price represented an increase of the full freight from Chicago, over the Chicago price. More recently the difference is about half the freight. In the meantime freight rates have about doubled. In the past 15 years the percentage of scrap used at Pittsburgh has not changed materially but that representing the consuming capacity of Chicago mills has increased about tenfold.

S. J. Llewellyn, president of the Interstate Iron & Steel Co., whose experience goes back to 1879, revealed some of the conditions that obtained in past years in the steel industry. He told of the situation in freight rates when these were bargained for like any other commodity and roads made special rates on definite shipments, to obtain the business, rebating the difference from the rate charged other shippers. He told of pools and price agreements, but said the agreed prices usually were broken by some of the parties.

No Agreement Was Made

In recent years, he testified, his company has not been a party to any agreements as to price. At no time, present or remote, was any agreement made to sell on a Pittsburgh base.

In recent years, said Mr. Llewellyn, both producer and consumer are better informed as to market conditions and prices through trade papers, whose quotations and comments are more accurate than two decades ago. This is partly due to the greater frankness of producers and consumers in giving information to the trade papers. At present quotations printed in these papers, he said, are close to the actual general condition.

All through his testimony Mr. Llewellyn emphasized the fact that every sale stands on its own base and the factors entering into it differ materially, even at the same period. The nature of competition, the service in delivery and quality the mill can give, and the personal relation of buyer and seller make up the more important features of a sale.

He stated that his company being smaller than many of its competitors, must give more in service and quality to obtain business and as a result of the development of these features it usually is able to obtain a better average price. This also is necessary since its costs are higher because of less control over its raw material sources as it has no mines of blast furnaces to produce its pig iron.

Frank Baackes, vice president and general sales agent of the American Steel & Wire Co., presented rather a different angle in describing the methods of his company in selling its product. The company has mills in New England, at Worcester, Mass., in the Pittsburgh district, at Cleveland, at Anderson, Ind. at Joliet, Ill., and at Waukegan, Ill. Thus it can be classed neither east nor west.

It makes all its prices on a Pittsburgh base, selling on a delivered price at the customer's location. The latter price is the Pittsburgh base it has established, plus freight to the point of delivery, whether that be east, west or south. To meet competition it is frequently necessary to modify the Pittsburgh base to obtain business.

The use of a Pittsburgh base price is necessary, Mr. Baackes explained, because each mill of his company is to some extent the producer of a specialty which other mills do not make. Some products are common to all or most of its mills. As a result it is not known when an order is booked whether it will be shipped from an eastern or a western mill. It may move from Worcester to Nebraska, or from Waukegan to Boston. The same base Pittsburgh price rules in either case, as well as on shipments from Waukegan to Chicago and from Worcester to Boston. This method of quoting and selling has been in effect ever since Mr. Baackes has been in the wire business, he said, and the trade could not be carried on in any other way.

His company being a subsidiary of the United States Steel Corp. he was asked how much supervision of prices is exercised by the latter. He replied that when costs were such that a fair profit could not be made at the existing price he recommended to the corporation that they be increased. When it seemed wise to reduce the entire price structure because of market conditions he did likewise,

Sometimes his recommendation was followed and sometimes not. In making prices to meet competition in any district, his judgment was relied on and he authorized changes to meet conditions, only the general change in prices requiring sanction from the corporation.

Taking the tonnage of wire shipped to Chicago or west from eastern mills as a base of 100 per cent, that shipped from western mills to the East is about 15 per cent. Western producers of wire and nails never have been able to meet the full requirements of consumers in the West in normal conditions of the market, he said, eastern mills always being called on to supply the deficit.

As to establishment of the Pittsburgh base from which to figure delivered prices, Mr. Baackes stated that each producer makes up his own base to suit his costs and the condition of the market, there being no agreement between producers. Sometimes competitors adopt the same price as his company and at others times are above or below it. He said usually they were on a higher level than his company.

E. M. Adams, vice president in charge of sales for the Inland Steel Co., Chicago, testified that about 40 per cent of the products of his company are sold in the Chicago switching district, about 5 per cent east of Chicago and the remainder in western states.

Prices depend on the conditions surrounding each sale, as to desirability of the tonnage, competition and ability of the mill to meet requirements of the buyer. Prices usually are higher f. o. b. Chicago than f. o. b. Pittsburgh, in past years by about as much as the freight from Pittsburgh to Chicago, but recently much less than that amount.

Growth and development of the Inland Steel Co. from its inception to its present position of importance were related by L. E. Block, chairman of the board of directors of that company, who has been an official from the beginning. That the growth of the company was possible is due to the fact it could take advantage of its location and obtain a higher price for its product than competitors in the Pittsburgh district much better fitted to produce steel as regards costs.

Adjournment was taken Friday to Monday because of illness of expected witnesses. The hearings here probably will be terminated this week.

Since exhibits of contracts and invoices of the Illinois Steel Co. were objected to by counsel for the commission and were admitted by the examiner under the remark that they probably represented too small a percentage of the total number, counsel for the Steel corporation proposed that counsel for the commission suggest a method of choosing contracts and invoices from the thousands in the company's files, and that the examiner indicate how large a percentage of the total contracts would be regarded as representative. The commission's counsel declined to assist in this way.

Either of two courses remains, for the Steel corporation attorneys to use their own judgment in selection or to abstract the entire number of contracts, a matter of months, if not of years. The purpose of submitting these contracts with comparisons of their prices with those in trade papers is to show a constant variation of price from the Pittsburgh base over a long period of time, 1908 to 1915.

Beehive Coke Output Still Is Gaining

The production of beehive coke which has been increasing steadily for many weeks showed further increase in the week ended Feb. 10. The total output estimated from reports of cars loaded by the principal coke carriers and in part on reports from producers to the United States geological survey, was 359,000 net tons against 348,000 tons in the week before. The total production of beehive coke for the year to date is 2,010,000 net tons against 706,000 net tons in the corresponding period of 1922. The following table shows the output by districts:

	Week ended		
	Feb. 3 1923(a)	Jan. 27 1923(b)	Feb. 4 1922
Penn. and Ohio.....	279,000	277,000	97,000
West Virginia	20,000	22,000	7,000
Ala., Tenn. and Ga. ..	18,000	17,000	5,000
Va. and Ky.....	16,000	15,000	6,000
Colo. and N. Mex..	7,000	7,000	3,000
Washington and Utah	5,000	5,000	4,000
United States total..	345,000	343,000	122,000
Daily average	58,000	57,000	20,000

Bituminous coal output is running slightly less than some weeks ago. This is partly due to transportation difficulties. Preliminary estimates for the last week show that 10,600,000 tons were mined against the weekly rate of about 11,000,000 tons in January.

Rail Earnings Improve

Washington, Feb. 20.—On their tentative valuation of $19,000,000,000 the class one railroads of the United States in 1922 had a net operating revenue of $776,421,400 or 4.14 per cent, according to the American Railway association. In 1921 the net operating revenue totaled $615,945,000 or 3.28 per cent. Increased efficiency in 1922 is evident; for the railroads handled 9 per cent more traffic than in 1921 and yet decreased operating expenses 3.2 per cent. Gross operating revenue in 1922 was $5,616,284,800.

Coke Plant To Be Built at Hamilton, Ont.

Toronto, Ont., Feb. 20.—P. V. Byrnes, president of the United Gas & Fuel Co. of Hamilton, announces that contracts have been let for the erection of a by-product coke oven plant in that city, which represent an investment of $2,500,000. A site of 35 acres on the waterfront has been secured. The plant will be erected by the Hamilton By-Product Coke Oven Co., Ltd., which has a contract with the Semet Solvay Co. of Syracuse, N. Y., enabling it to adopt the latter's plans and processes in coke-oven construction.

The strike situation at the Sydney plant of the British Empire Steel Corp. has become serious. Only a few of the 3700 men employed there remain at work, and picketing activities are being carried on aggressively by the strikers. Difficulty is experienced in raising enough heat and steam to keep the by-product coke plants warm and it is stated that should this section of the plant get cool prematurely it will mean that the steel mills will not reopen for a year. An attempt to settle the strike by a conference between officials of the corporation and the union resulted in a disagreement. The Sydney city council has appointed a citizens' committee with a view to effecting a settlement.

The union notified James Murdock, Canadian minister of labor, of the strike, charging the company with discrimination against union men culminating in the dismissal of several of them. The minister suggested that it would be better for the men to resume work pending investigation of the dispute with a view to its settlement by mutual agreement. Speaking in the House, Mr. Murdock declared that the steel strike in Sydney was part of the campaign of the workers' party of Canada, which to all intents and purposes, is the communist party, the party now in control of Russia. He described the situation as "serious indeed," and stated that every effort was being made to handicap the steel industry. If the efforts were sucessful irreparable damage would be done to the steel plant.

Western Demand Gains

Producers Sold Out in Some Lines—Plate Market Exceptionally Heavy —Building Continues Heavy—Advances Noted in Several Markets

SAN FRANCISCO, Feb. 17.—Demand for all forms of steel products continues strong and no let up is in sight. The situation today, as regards steel, is a seller's rather than a buyer's market and consumers, finding that their regular sources connot furnish them the needed material, are offering tonnages to other mills. The leading interest and some of the independent producers are out of the market in certain lines and mill shipments are becoming more and more extended. Construction activity continues in a large volume. Los Angeles reports building permits, up to and including Feb. 6, totaled $3,099,107, which compares with $2,410,097 for the same period in January.

Pig Iron and Coke

Foundry interests are again entering the market with inquiries. The majority of these, however, involve small tonnages. A sanitary ware concern has an inquiry out for 1000 tons while another interest is asking for 100 tons. The Southern Pacific Co. has closed for 500 tons of iron equivalent to No. 2 foundry and it is reported that English material was purchased at a price around $32 c. i. f. San Francisco. Practically all Belgian furnaces have withdrawn from this market and English and Scotch iron is the only foreign material obtainable. Prices for this iron are advancing and one importer received a cable quotation this morning on English iron, of $32 a ton.

No large coke sales have been noted recently but better demand, in small lots, is reported. Foreign material is being quoted at around $17 a ton.

Bars, Plates and Shapes

Local rolling mill operators report a better volume of merchant bar business being booked, composed mostly of small tonnages. Open-hearth operations remain unchanged, six out of twelve going. The Pacific Coast Steel Co. plans to start another furnace within a few days.

Activity in the plate market has been exceptionally strong since the first of the year and prices have been steadily rising. Some large tonnages have recently been placed. One tank fabricator placed 5000 tons with Midvale Steel & Ordnance Co. at a price understood to have been 2.65c c. i. f. San Francisco, while a Los Angeles tank concern placed 7500 tons for oil storage work. The minimum price appears to be 2.65c c. i. f. Coast ports and business has been placed as high as 2.80c. The leading interest is practically out of the market being unable to give under 12 weeks mill shipment. The Pan-American Oil Co. awarded 25 80,000 barrel tanks to the Lacey Mfg. Co. of Los Angeles, involving 7500 tons. The Petroleum Midway Co. of San Pedro, has placed 20 80,000 barrel tanks with the Chicago Bridge & Iron Co., 6000 tons involved. The Standard Oil Co. has awarded 5 80,000 barrel tanks to the United States Steel Products Co., 6 80,000 barrel tanks to the Western Pipe & Steel Co and 2 80,000 and 1 68,000 barrel tanks to the Lacey Mfg. Co. involving a total of 5200 tons. The Associated Oil Co. has placed 7 80,000 barrel tanks with the Western Pipe & Steel Co. and six with the Steel Tank & Pipe Co., 4900 tons involved. The Union Oil Co. has taken no action yet on their inquiry for 30 80,000 barrel tanks involving 9000 tons. The Moore Dry Dock Co. of Oakland was awarded a penstock for the Yuba Development Co. involving about 75 tons.

The leading interest has again advanced prices on wire products, hard bright wire now being quoted at 3.40c c. i. f. San Francisco, and nails at 3.50c c. i. f. San Francisco. Demand continues in heavy volume and mills are allocating tonnages. The Southern California Edison Co. has awarded 1000 tons of wire cable to the California Wire Co., Orange.

Warehouse

Jobbers have advanced prices on most lines during the past week. Demand is strong and exceptionally heavy at this time of the year. Plates and cold rolled are in specially heavy demand. Prices in San Francisco have been advanced as follows:

Bars from 3.40c to 3.50c; shapes from 3.40c to 3.50c; plates from 3.50c to 3.60c; bands from 4.05c to 4.15c; cold rolled shafting from 5.00c to 515c bright nails from 4.10c to 4.20c; machine bolts quoted from 40 off to 35 off and machine bolts small from 40-5 off to 40 off. Los Angeles prices have been changed as follows: Bars from 3.50c to 3.70c; shapes from 3.60c to 3.80c and bands from 4.40c to 4.60c. 4.60c.

Northwest Market Is Firm

SEATTLE, Feb. 17.—The iron and steel market is firm and within the last week prices on a number of commodities have advanced. Exceptionally severe winter weather with deep snow has temporarily paralyzed business in Washington and Oregon. Notwithstanding the present situation, the market is active. Foundries and machine shops are operating at larger capacity and the sales of pig iron and coke have increased.

Several sizeable awards have been made this week. Contract for supplying 2400 tons of structural steel for Seattle's new hotel, the Olympic, was let in New York today to the American Bridge Co.

Pig Iron and Coke

With foreign exchange advancing and Europe cut off as a source of supply, importers report the pig iron situation very firm. Local importers state that it is increasingly difficult to place business as a majority of United Kingdom producers of high grade iron are sold to the end of the year. Pig iron has advanced, No. 1 Glengarnock now being quoted here at $35.50, all paid. British hematite, with low phosphorous content is quoted here at $36. Southern iron is unable to compete on this coast. Even with a water rate of $11.20, the best prices possible are above $40. Oriental iron is also non-competitive, Hang-Yang being quoted at $38 to $40.

Coke is in about the same position, with prices firm and consumption increasing. The turnover of Fernie, which is supplying most of the coast demand, has been heavy recently due to the expectation of a strike April 1, at the British Columbia mines. British coke has advanced in price so that it cannot be sold here under $20. Consequently there has been an increased demand for Fernie, which is still quoted at $16.50 here.

Bars, Plates and Shapes

Effective Feb. 12, both the local mill and the warehouse raised merchant bars. The mill advanced from 2.65c to 2.75c while jobbers went up 15 cents to 3.75c. Shapes have taken a similar advance and the same is true of plates. Demand for these items is excellent. There is continued inquiry for bars, mostly reinforcing, from Oriental sources and local interests have quoted on between 2000 and 3000 tons for delivery in China. The local mill announces no change in the prices of reinforcing but is quoting on each individual project.

Other Finished Material

In line with increases in bars, plates and shapes, jobbers have advanced bands and shafting, sheets and hoops not being affected. Bands, until recently 4.35c, were advanced to 4.50c last week and again this week to 4.75c. Shafting is up to 5.40c. Some jobbers are practically out of stock in some lines and deliveries have been uncertain so that stocks are not uniform. The whole situation looks strong.

Old Materials

This market is unchanged. The demand for No. 1 cast iron scrap remains active and prices are firm. Dealers are having difficulty in supplying their customers and stocks are extremely low. There is increasing interest in steel scrap for export although firmer freight rates and difficulty of getting ocean space are retarding sales to Japan, at present the best market for this material.

Germans Blow Out 19 Stacks

Embargo Imposed by French Beginning To Have Serious Effect—Exports Cease—Ten Additional Stacks in France Are Down—No Coke Received from Ruhr—British Operators Bidding Up Fuel—Price Advances Checking Markets

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Feb. 19.—German iron and steel producers are beginning to feel the pinch of the Ruhr invasion seriously. Nineteen stacks have been blown out, 14 of these being at Krupp plants; two at the Stahlwerk Becker and three at the Concodia Hutte. Contracts are being made subject to the French export tax of 10 per cent. The last items shipped prior to the embargo included 20,000 tons of rails for Argentina and 6000 tons for Japan. The Berlin correspondent of IRON TRADE REVIEW wires:

"Traffic in the Ruhr district is 5 per cent of normal. Iron ore stocks are sufficient for a few months, and more supplies of limestone have been obtained. There are no exports at present. The embargo imposed by the French on iron and steel products to the unoccupied portion of Germany has been effective only since Feb. 15. Furnaces in the Upper Silesian district are being blown in."

The French corerspondent of IRON TRADE REVIEW wires from Paris:

Sterling—$4.70

"Deliveries of coke from the Ruhr have ceased since Jan. 19 and substitute supplies have been obtained from England, Belgium and Czecho-Slovakia. These amount to only 600 tons daily, entirely insufficient to meet requirements. Ten more stacks have been blown out, including three at Thionville; five at Longwy, and one each at Pompey and Knutange. The Belgians have not blown out any furnaces but have banked three. Foundry pig iron is very scarce and has been sold up to 335 to 345 francs ($20.31 to $20.91). Longwy foundry iron is 360 francs ($21.83).

The effect of the Ruhr invasion in general is nearly as serious as was that of the war. Advances have checked the British market, but furnaces and mills have comfortable backlogs for the second quarter. Belgian pig iron is offered at £5 ($23.50) at British ports, and Belgian makers also are offering billets. The shortage of coke is leading British furnaces to offer £1 11s ($7.20) for furnace fuel. The starting of the largest Welsh billet mill has not had any effect on the advancing tendency of semifinished prices. The unsatisfactory supply of labor is limiting the output of tin plate it is reported by makers.

Leading makers have agreed to advance the export price of ferromanganese to £16 f. o. b. which is equivalent to $110 c.i.f. United States. Recent orders for ferromanganese from the United States are for 5000 tons weekly. Spiegeleisen for export has been advanced to £8 10s ($40.03). British iron and steel for January, not including scrap, amounted to 353,000 tons, and imports 129,000 tons.

In the British market billets and sheet bars for home consumption now are quoted at £8 5s ($38.85); bars for domestic consumption are £10 10s ($49.45), and for export £10 quoted at £5 6s ($24.96) and West coast hematite and Scotch foundry iron, £5 7s 6d ($25.31).

British Interests Uneasy Over Market's Position

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

BIRMINGHAM, Eng., Feb. 8.—The upward movement in prices has made substantial progress. all grades of pig iron being higher while certain finished and semi-finished products are sharing in the advance. To some extent the movement has been stimulated by events in the Ruhr and this has caused a little uneasiness.

Several additional furnaces are being prepared for operation, especially in the Cleveland area. The number of furnaces operating on the northeast coast is 38, of which 12 are making ordinary Cleveland iron, 14 producing hematite and 12 producing special grades of iron. The great scarcity of Cleveland material has raised prices somewhat, brands which lately sold at £4 12s 6d ($21.55) now changing hands at £5 5s ($24.46).

A counteracting circumstance is the great scarcity of coke, which is one of the results of the continental trade disturbance. Hardly any coke is to be had and contracts with the continent provide for regular and fairly heavy deliveries until April. Several Midland

Sterling—$4.66

furnaces would be put to work immediately if coke could be obtained. Some of the largest concerns are operating on slack blast because of coke scarcity.

The Midlands have to some extent shared in the rise in pig iron values, Northampton ordinary iron being quoted at £4 10s ($20.97) per ton and Derbyshire £4 12s 6d ($21.55). Makers have only part of their plants in operation, and the small production is fully committed. Contracts entered into during the last few days include some large lots for shipment to the United States, especially to the west coast.

Business in semifinished and finished steel continues to expand, with hardening prices. The Stele Co. of Scotland recently started its Blackairn works a new mill capable of producing 1500 tons of ship plates per week. Large mills in the Barrow area have business on hand to keep them occupied until April. In Sheffield the number of plants operating is increasing.

A noteworthy feature is the improvement in the engineering trade. This is less noticeable at the largest plants than at those of medium size dealing with general business. There is a lot of work and railway demands of various sorts in the market which should insure activity during the early months of the year.

Nearly all descriptions of finished steel are higher, but any tendency towards inflation, especially in the north of England is checked by the fine price cutting, in which makers in Scotland have been conspicuous. There is still a wide margin in prices for export and for home consumers. The Scotch makers of black sheets have issued new price lists involving advances of 5 shillings ($1.16) to £1 ($4.66) on sizes varying from ¼-inch upward; the first size, namely from ¼-inch to 3/16-inch being quoted at £11 ($51.26), and 20 to 24-gage £13 15s ($64.07). This is the first advance in that line following a long series of reductions.

Demand for semifinished steel is strongly indicative of the unusual conditions. Continental steel normally formed such a large proportion of the material used in the Midlands that its

Current Iron and Steel Prices of Europe

Converted into Dollars at Rates of Exchange, Feb. 19

British Market

Home Market Prices. Gross Tons at Works or Furnaces

Corrected to Date by Cable

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	38.78	8 5 0
Sheet bars	38.78	8 5 0
Wire rods	48.18	10 5 0
FINISHED STEEL		
Steel bars, England, ½ to 3-inch	49.35	10 10 0
Steel bars, England, ⅝ to 3-inch, for export	47.00	10 0 0
Plates, ship, bridge and tank, England	44.65	9 10 0
Plates, ship, bridge and tank, England, for export	41.13	8 15 0
Plates, ship, bridge and tank, Scotland	42.30	9 0 0
Plates, ship, bridge and tank, Scotland, for export	39.37	8 7 6
Beams, England	42.30	9 0 0
Beams, England, for export	39.95	8 10 0
Beams, Scotland	41.13	8 15 0
Beams, Scotland, for export	38.78	8 5 0
Sheets, black, 24-gage	58.75	12 10 0
Sheets, galvanized, 24-gage	89.30	19 0 0
Rails, 60 lbs. and over	42.30	9 0 0
Rails, 60 lbs. and over, for export	39.95	8 10 0
Tin plate, base box, 108 lbs	5.06	1 1 6
Steel hoops	54.05	11 10 0
Steel hoops, for export	51.70	11 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	24.92	5 6 0
Hematite, West Coast, Mixed Numbers	25.27	5 7 6
Basic, Middlesbrough	23.50	5 0 0
No. 3 Foundry, Middlesbrough	25.85	5 10 0
No. 3 Foundry, Derby, Leicester, Nottingham	22.33	4 15 0
No. 3 Foundry, Northamptonshire	21.74	4 12 6
No. 3 Foundry, Staffordshire	22.33	4 15 0
No. 3 Foundry, Scotch	25.27	5 7 6
Ferromanganese, 76 to 80 per cent	70.50	15 0 0
Ferromanganese, 76 to 80 per cent, for export	75.20	16 0 0
COKE		
Yorkshire furnace	7.05	1 10 0
Yorkshire foundry	8.23	1 15 0

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	18.48	384,900
Foundry, No. 3, Oberhausen	18.37	382,700
Bessemer Stahleisen, Siegen	15.12	314,900
Foundry, No. 1, Oberhausen	18.39	383,100
Luxemburg Foundry	17.89	372,700
COKE		
Ruhr furnace	2.67	55,590
Ruhr foundry	2.78	57,869
SEMIFINISHED STEEL		
Billets	22.28	464,200
Sheet bars	24.33	506,900
Wire rods	23.65	492,700
FINISHED STEEL		
Standard rails	27.55	574,000
Merchant bars	27.65	576,000
Structural shapes	27.40	570,900
Ship plates	31.15	649,700
Medium plates, 3 to 5 millimeters	35.06	730,500
Sheets, below 3 millimeters	43.30	898,000
Tin plate	85.68	1,785,000
Plain wire	29.54	615,500
Bands and strips	33.17	691,000

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

	$	Francs per metric tons (2205 lbs.)
PIG IRON		
Hematite, Lorraine	22.74	375
Basic Bessemer, Lorraine	17.59	290
Foundry, Longwy, No. 3, sand-cast	16.98	280
Foundry, Longwy, No. 3, chill-cast	17.59	290
Ferromanganese, 76 to 80 per cent	69.75	1,150
COKE		
French furnace	7.28	120
German furnace, f.o.b. frontier	6.67	110
French foundry	7.88	130
SEMIFINISHED STEEL		
Blooms	25.17	415
Billets	28.10	465
Sheet bars	29.42	485
FINISHED STEEL		
Standard rails	33.36	550
Merchant bars	33.36	550
Angles	32.45	535
Normal beams and profiles	31.54	520
Plates, ship and tank, 10 millimeters and thicker	34.27	565
Plates, bridge and tank, 5 to 10 millimeters	35.17	580
Sheets, black, 3 millimeters	37.60	620
Sheets, blue annealed, 2 millimeters	40.03	660
Shafting, cold-drawn, 40 to 60 millimeters	51.55	850
Bars, 2 per cent nickel steel	87.94	1,450

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	17.09	320
Basic open-hearth, Belgian	17.36	325
Gray forge, Belgian	14.42	270
Foundry, No. 3, Belgian	18.16	340
Foundry, No. 3, Luxemburg	17.36	325
Foundry, No. 3, Lorraine	17.36	325
SEMIFINISHED STEEL		
Blooms	22.43	420
Billets	23.50	440
Sheet bars	24.30	455
Wire rods	35.78	670
FINISHED MATERIAL		
Standard rails	25.90	485
Merchant bars	29.37	550
Normal beams and profiles	27.77	520
Plates, 5 millimeters and thicker	31.24	585
Sheets, black, 3 millimeters	32.31	605
Sheets, galvanized, 1 millimeter	88.91	1,665
Plain wire	45.92	860
Galvanized wire	58.87	1,065
Wire nails	31.24	585

All prices are f.o.b. furnace or works.

practical disappearance has given a strong impetus to the buying movement as it affects British works. Heavy tonnages have been placed through merchants and prices have steadily improved so that the figure of £8 ($37.28), quoted at Birmingham, appears to be the minimum. Many firms are quoting up to £8 5s ($38.44) and £8 10s ($39.61). Apparently, France and Belgium are unable to guarantee supplies owing to the fuel position, but if they were able to send in steel at anything like recent quotations, they could capture a great deal of British business, in view of the rather inflated British prices prevailing.

The sequel of the keen price cutting in the Staffordshire iron trade is a reduction of 2½ per cent in the wages of iron workers under the Midland board, to take effect April 7. The sweeping character of these reductions is shown by the fact that the rate of wages is now brought down to 40 per cent above the quoted basis.

Ruhr Plants Have Large Fuel Supplies

European Special Service

DUSSELDORF, Germany, Feb. 7.—Work continues in the Ruhr district but under difficult conditions. The production of coal is now about 180,000 tons a day as compared with 300,000 tons before the occupation. The French embargo against the shipment of coal to unoccupied Germany is only partly effective but considerable tonnages are being held back. In the meantime a few trainloads are going forward to France and Belgium with the result that the plants in the Ruhr itself have unlimited supplies of coal and coke for the time being. An agreement under which the railways will resume operation has been reported, but traffic conditions are still extremely disorganized. It has frequently been im-

Mark—$0.00002

possible recently to go by rail from Dortmund to Dusseldorf; travelers have been forced to use the street car lines which connect the various towns in the Ruhr. The trip from Dortmund to Dusselrodf by this method takes 10 hours for a distance of 35 miles.

About half a dozen German furnaces have been banked as a result of the fuel situation. Krupp's Friedrich Alfred Hutte at Rheinhausen on the west bank of the Rhine is in difficulties because of the embargo on shipments of fuel from the Ruhr to German plants in the old occupied territory. This plant, which consists of 12 blast-furnace stacks, is one of the largest on the continent.

A little more business is being transacted and some export orders are being put through. Overseas business is seriously handicapped by difficulties over export licenses. Licenses can only be obtained from the French authorities for shipments originating in occupied territory. These licenses, however, are not recognized by the German authorities, and conversely licenses issued by the German government are not recognized by the French authorities. The result is chaos, although some tonnage is getting out over the Franco-Belgian controlled railway from Cologne through Aix-la-Chapelle to Brussels. Also, since the German railwaymen are striking only against the French and Belgians they are not adverse to assisting in the smuggling of exports out of the occupied zone whether they are provided with French export licenses or not.

It is reliably reported that the German pig iron syndicate is placing large orders for pig iron in Czecho-Slovakia for consumption by German consumers. Although pig iron now is fairly steady steel prices are advancing sharply. Expressed in marks, current quotations are now 3000 per cent above those of August, 1922, but the depreciation of the currency is so great that gold prices are low and further increases in paper mark quotations, therefore, may be expected covering all iron and steel products. Billets are now 693,000 marks ($17.30) per metric ton, with sheet bars 757,000 marks ($18.90) a ton and rail 850,000 marks ($21.20). Bars, shapes and plates range from 860,000 marks to 970,000 marks per ton equivalent to 0.98c to 1.11c per pound. Black sheets under 1 millimeter are now 1,341,000 marks per metric ton or 1.52c per pound, with plain wire 919,000 marks and bands 1,032,000 marks per ton, equivalent respectively to 1.04c to 1.17c per pound. Very little business is being transacted.

Belgian Makers Withdraw from Market

European Staff Special

BRUSSELS, Feb. 9.—Few transactions are noted in the Belgian iron and steel market, although the demand is somewhat feverish. Buyers are anxious to replenish their stocks, but nearly all the furnaces and steel plants have dropped out of the market. On both sides this attitude is caused by the uncertainty of prices, for the estimate of production costs is practically impossible to make at present. As a result of this state of affairs, the quotations which are registered are purely nominal and simply indicate the tendency of the market.

However, it is reported that orders which had been passed by England to German concerns have been canceled by the latter and that the inquiries have consequently been received in Belgium. It is also rumored that a number of German firms have been placing in Belgium orders which they were not in a position to fill. The coke shortage is beginning to be felt in Belgium and prices are rising. The price of scrap

Franc—$0.055

is also ascending especially since no more scrap can be imported from France, owing to a recent decree of the French government. However, the Belgian government has also decided that no scrap could be exported from Belgium and it is hoped that an agreement with France will follow, thus enabling Belgian iron and steel producers to obtain their requirements at a lower price. It is expected that the recent depreciation of the Belgian franc will bring about a new campaign for a readjustment upward of wages. In the meantime, employers have decided to maintain wages at their present level during the month of February.

The following export orders have been obtained recently: 85 small freight cars have been ordered from the Forges de Bellecourt by the State of Pernik, in Bulgaria; the Bulgarian railway has also passed an interesting order of bolts to the Boulonneries de la Louvière. Cockerill has been awarded the construction of a bridge on the Catumby river, by the Brazil railway.

La Providence has banked a furnace at its Marchienne plant owing to coke shortage. Sambre & Moselle, having their own cokeries, have blown in a new stack.

Offers for No. 3 foundry pig iron are said to have been made at 350 francs ($19.25) per metric ton. Basic bessemer iron cannot be obtained at any price. Belgian hematite is offered at 430 francs ($23.60). The demand from America is considerable.

In the semifinished steel department, more mills are drawing out of the market while the demand is growing, not only from Great Britain, but also from domestic transforming mills. The price of 420 francs ($23.10) is said to have been made on ingots.

Acute Coke Shortage Develops in France

European Staff Special

PARIS, Feb. 9.—The situation of the French iron and steel industry is becoming more acute. Practically no business is being transacted. Not only are furnaces and steel plants gradually dropping out of the market, but transforming mills also are compelled to draw back. In the eastern district and Lorraine more furnaces have been banked or blown out. At Pont-a-Mousson two more stacks have been banked, and three more have been blown out at the de Wendel Works at Moyeuvre, Joeuf & Hayange; Micheville have banked two furnaces and five have been banked at Hagondange. Since Jan. 1, about 30 furnaces have ceased blowing.

Practically no coke is received from Germany at present. The Franco-Belgian commission has obtained one result, that is preventing any combustible from leaving the Ruhr basin in destination of Germany. Now ways and means of bringing coal and coke into France have to be arrived at and it will take some time before a tangible result is obtained in view of the strikes which have broken out. Transportation will have to be completely reorganized. This task has been undertaken, but the most ardous part of the problem is the working of the mines and all efforts are now being made in this direction.

Franc—$0.065

The new base prices of furnace coke, to take effect on Feb. 15, have been fixed by the Societe des Cokes de Hauts-Fourneaux at 150 francs ($9.75) per metric ton for the price P1, and 200 francs ($13) for the price P2; P1 being the price for any tonnage delivered to concerns up to 40 to 50 per cent of their normal requirements, and P2 the price for any tonnage over and above that proportion. Several concerns have bought coke from England at a price ranging from 230 francs ($14.95) to 250 francs ($16.15) per metric ton, delivered. A number of Lorraine plants have also bought coke from Czecho-Slovakia at a high price, although below English prices. The French mines of Douchy which have a battery of 50 coke ovens active will shortly light two new batteries, each composed of 40 ovens.

Pig iron production is considerably reduced. No. 3 foundry pig has reached 290 francs ($18.85) per metric ton and a further increase is expected to follow rapidly. English foundry pig has been offered at 400 francs ($26) to 430 francs ($27.85) f.o.b. English port. Export business would be remunerative if production were sufficient, but only Luxemburg appears to be exporting at present.

The price of hematite pig iron has reached 400 francs $26) in the northern district. It now is understood that certain steelmakers are quoting their prices subject to any increase in the price of coke. Beams, for instance, have been quoted 520 francs ($33.70) plus 2.25 francs ($0.15) for every increase of 10 francs ($0.60) in the price of coke.

Rail Orders Reported Placed in Canada

Foreign Special Service

TORONTO, Ont., Feb. 19.—Inquiry for pig iron in the Canadian market is backward, and sales for the past week were comparably small. Demand is confined largely to limited tonnages for spot delivery. The Dominion Steel Corp., Sydney, N. S., has been making shipments of basic and foundry iron to the United States, but it is stated that the greater part of this iron is off-grade basic, being high in phosphorus, and is therefore being mixed by American melters with standard basic. The Algoma Steel Corp., Sault Ste. Marie, Ont., has but one furnace blowing at present on foundry iron, but is making repairs to other furnaces and proposes to blow in two stacks for basic in the near future. Pig iron prices are firm. No. 1 (2.25 to 2.75 silicon) and malleable are quoted at $33.55 and No. 2, (1.75 to 2.25 silicon) at $32.55, Toronto. No. 1 and malleable are $35.90; No. 2, $34.90; Summerlee and Carron, imported, $33 to $35, Montreal.

In the finished iron and steel market business is making good headway. The demand for many lines of material is becoming more active and mills are continually closing orders for tonnages of various sizes. It is reported that the Steel Co. of Canada, Hamilton, Ont., has received a substantial order from the Canadian national railways which includes tie-plates and spikes, which has resulted in increased operations at the plant. The Algoma Steel Corp. expects to start work within the next two or three weeks on a large rail order for the Canadian national railways, and is also putting its structural mill in shape to start operations about April 1. The past month has seen a decided change for the better in the demand for structural steel and reinforcing bars and a number of good orders have been closed.

A more active demand is noted for bars. It is announced that preparations are being made to increase the number of open-hearth furnaces in operation at Hamilton, Ont. The Steel Co. of Canada, Hamilton, Ont., has sufficient orders on its books for bars to keep its plant in operation for a considerable period and is about six weeks back on deliveries. Bars are holding firm at 2.70c, Toronto.

The Baldwin Canadian Steel Co., Toronto, Ont., is being reorganized and it is stated that the plant will resume operations in the near future.

German Iron and Steel Exports Decline

Berlin, Feb. 8.—German exports of iron and steel in November were 233,553 metric tons. This is a slight decline compared with October and September although the November shipments were above the average of the summer months. The November exports compare with 246,074 tons in October and 244,012 tons in September.

Among the principal export items in November were 42,718 tons of bars and bands, 29,291 tons of rails, 19,732 tons of scrap, and 19,230 tons of plates. Imports in November were 236,000 tons or 2447 tons in excess of the exports. The imports now have been exceeding the exports for three months. Among the principal items imported in November were 72,626 tons of bars, 42,872 tons of scrap, 33,102 tons of semifinished steel, 28,214 tons of pig iron, 23,269 tons of rails, and 14,503 tons of plates.

The exports of machinery in November were 33,617 tons compared with 42,448 tons in October and 31,012 tons in September. The imports of machinery in November were 952 tons compared with 909 tons in October and 914 tons in September.

Scrap Maintains Strength

(*Concluded from Page 562*)

50 cents a ton to $21.50 to $22; machine shop turnings up 25 cents to $16.75 to $17; hydraulic compressed sheets up 25 cents to $19.25 to $19.50; bundled sheets up 50 cents to $16.50 to $17; old steel rails up 50 cents to $20.50 to $21; forge flashings up 25 cents to $17 to $17.25; agricultural and railroad malleable up 50 cents to $23 to $23.50 and $24 to $24.50 respectively: No. 1 cast up 50 cents to $24 to $25; stove plate up 50 cents to $20 to $20.50. The only change in Mahoning valley prices applies to hydraulic compressed sheets which have advanced 50 cents to $21.50 to $22.

Activity Is Noted

Birmingham, Ala., Feb. 19.—Activity in old material yards in the Birmingham district is noted, a steady shipment of scrap being seen and much of it being brought in for preparation for distribution.

Prices Continue Upward

Boston, Feb. 20.—An easier situation as to the shipment of scrap westward has stimulated an already active scrap iron and steel market here. Local dealers report good sales during the week, and it is probable several thousand tons of heavy melting steel have been shipped from New England yards to Pennsylvania destination. Western Pennsylvania consumers have been bidding against one another in the local market and as high as $17.50 shipping point has been paid for choice grades of heavy melting steel. The Boston & Maine railroad within the week lifted its embargo on scrap. Slow shipments of pig iron continue to force foundrymen to turn to cast scrap and No. 1 machinery scrap has sold as high as $25 delivered. In the eastern part of Massachusetts the price ranges from $23.50 to $24.50 delivered. Demand for railroad malleable has dropped off slightly with the withdrawing from the market of the three principal buyers. The price, however, holds firm and sales made were at $23.50, delivered. Cotton ties have been in demand after a long period of dullness and sales at $13.20 are reported. Mixed borings and turnings have sold at $13.50. Rails for rerolling have advanced to $18.50.

Active Buying Is Noted

Philadelphia, Feb. 20.—Active buying of steel scrap is reported here. Pittsburgh consumers, during the past week took considerable material, at prices of $23.50 to $24 delivered. There is a strengthened tone to prices but so far the highest price offered by eastern mills is $21 delivered Bethlehem. While not much steel scrap has been bought by eastern mills considerable cast scrap has been taken by these interests, resulting in higher prices. Chief buying of the week involved wrought scrap for rolling mills. At least three works bought tonnages of No. 1 wrought at $25 delivered, and several lots of rails for rolling, aggregating 5000 tons went at $25 delivered.

Increasing Demand Noted

Cincinnati, Feb. 20.—Demand for iron and steel scrap gradually is increasing and buying from all sections is better. While buying in the Cincinnati district has attained no proportions, inquiries are more numerous. The firmness of the local situation largely is due to the activity in other markets, although several sales involving fairly large tonnages have been recorded here, but this business was consummated by foreign sources. Prices continue upword advances on a majority of items during the past week ranging from 50 cents to a dollar a ton.

Strength Is Exhibited

St. Louis, Feb. 19.—Growing scarcity, activity at other centers and a good demand from local industries were the chief factors in a continuance of strength in the scrap iron and steel market. Prices were advanced further to new high levels on some items. Extremely little new scrap is materializing, and yard stocks are dwindling. The demand is pronounced for steel grades, which are scarce. Cast iron also is receiving good call, with No. 1 railroad selling above $23. Rolling mill grades still are relatively slow and unchanged in price.

One steel interest here has been canvassing the small yards and dealers for material. Other consumers have been bidding direct on railroad lists. Offerings by the railroads are light, consisting of 600 tons by the Kansas City Southern, 300 tons of car wheels by the Wabash and 1800 tons by the Missouri, Kansas & Texas.

Business Strikes Unusual Stride

Many Measures of Trade Indicate Highest Rate of Activities Ever Known for This Time of Year—Inflation Danger Not Comparable with That in 1920—Credit Strain Absent Now

BY JOHN W. HILL, FINANCIAL EDITOR

BUSINESS has struck a stride in recent weeks never before equalled at this time of the year. This fact is clearly shown by numerous unquestioned measures of trade. Freight movements, building construction and automobile production are record-breaking. Iron and steel, copper and textile markets are phenomenally active. Employment is at high tide and bank clearings are large. IRON TRADE REVIEW's Monthly Business Index for Feb. 1 stood at 130 compared with 99 one year ago. The arrival of a prosperous era is also indicated by rising industrial earnings. Higher inventory values have been a factor in improving the financial position of industrial companies.

The belief is held in some quarters that business is racing toward the same dizzzy inflation and consequent sharp reaction as occurred in 1920. Facts do not support this view. The bureau of labor index of wholesale prices for Feb. 1 stands unchanged at 56 per cent above 1913. It has advanced 13 per cent in a year, but the rate of increase has subsided in recent months. In the spring of 1920 prices reached their peak at 147 per cent above 1913. Many competent authorities believe that the present rise will stop short of 70 per cent over the prewar level.

Similar lack of 1920 inflationary tendencies is seen in the financial situation. Although loans for commercial needs are increasing rediscounts of the federal reserve system are 70 per cent less than they were in February, 1920. Gold reserves are $1,000,000,000 greater. The cash ratio last week stood at 75.3 per cent against 42 per cent three years ago. Commercial paper rates are approximately 5 per cent compared with 7½ per cent early in 1920. The manifest danger which existed then in the credit strain is wholly absent now. Until this factor changes considerably, business has little to fear that recovery is going too rapidly.

Recollection of the experiences of 1920 are helping restrain runnaway markets in many lines. Moreover, the problem of consumer ability to absorb the price increases at retail made necessary by sweeping raw material advances, remains to be solved. Thus far all price rises have been readily accepted, the result of higher wages, greater employment and better incomes.

The National Industrial Conference board in a survey of wage changes between Jan. 15 and Feb. 15 finds 42 increases and no reductions. The lack of ample labor with all of its ramifications of increased costs, lowered production and higher prices, may constitute the most serious danger lurking in the present outlook. Indeed some economists believe that the revival will be checked by a labor shortage which is growing.

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The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One mo. ago	One year ago	1913
Business failures	361	371	540	610	450
Cash ratio Fed. Res. system	75.3	77	76.1	76.4	.....
Loan rate, 4-6 months N. Y. (per cent)	4½-4¾	4½-4¾	4½-4¾	4¾-5	5-5¼
Aver. 20 ind'l shares	$98.76	$96.06	$93.31	$80.33	$80.25
Aver. 20 rail shares	$89.05	$89.99	$85.11	$77.06	$110.50
Aver. 40 bonds	$79.37	$79.27	$78.55	$76.78	$93.00
Car loadings (week ended Feb. 3)	865,000	871,164	770,303	753,886	*762,680
Bank debits 235 cities (000 omit'd)	$8,383,598	$9,908,117	$9,898,095	$7,347,144	.....

*1920.

FOREIGN EXCHANGE (Demand)

	Normal	Feb. 19 (close)	Week before	Month ago	Yr. ago
Sterling	$4.86	$4.70⅛	$4.68	$4.66	$4.33
France	19.3c	6.06c	6.20c	6.79½c	8.54c
Lira	19.3c	4.80c	4.82c	4.90c	4.83c
Marks	23.8c	0.0048c	0.0035c	0.0073c	0.50c

MONTHLY COMPARISION

	January	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$217,365,000	$215,213,000	$165,900,000	$71,450,000
Business failures:				
Number	2126	1814	2723	1336
Liabilities	$49,210,497	$58,069,021	$73,795,780	$22,723,000
Exports	$339,000,000	$344,000,000	$278,848,000	$207,000,000
Excess of gold imports	$24,345,000	$23,730,000	$25,709,000	†630,716
Bureau of Labor Price Index	156	156	138	100
Bradstreet's Price Index	148.3	148.2	123	100
Economist's British Price Index	4324	4264	4284	2717
Cost of Living Index	‡158.9	158.4	162.7	100.0
New incorporations	$909,693,800	$813,901,000	$843,000,000	$172,301,000
Railroad net earnings	‡$79,154,000	$78,860,000	$49,656,000	$59,900,000

†November. ‡December. *Monthly average export excess.

The Business Trend

February 22, 1923

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Monthly Business Index makes sharp gain in January, reflecting rise in general trade activities since first of year; index now stands at 130 compared with 99 one year before; all basic factors continue to display great strength and a favorable outlook.

UNFILLED ORDERS—United States Steel Corp. bookings resume upward movement; now stand 62 per cent above one year ago; constructive forecast of general trade.

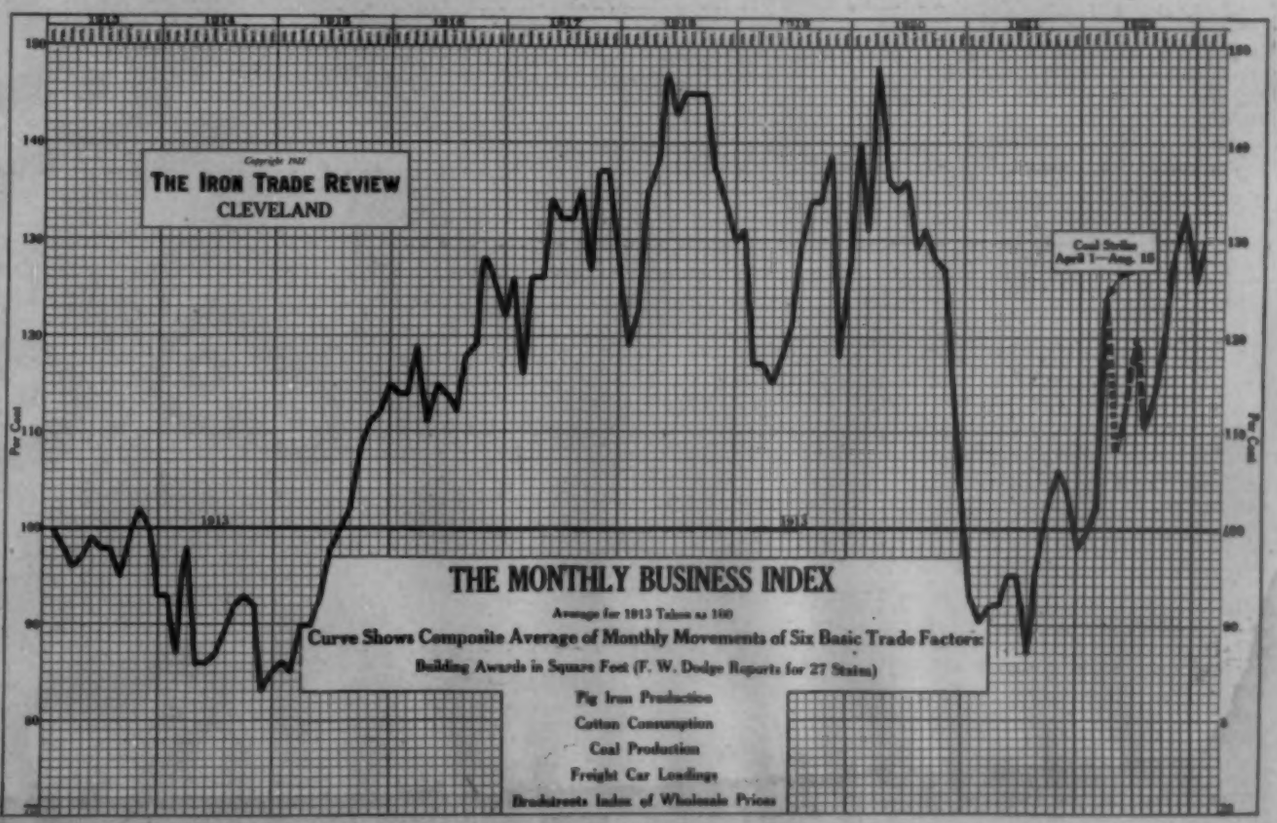
COTTON CONSUMPTION—January consumption of cotton by domestic mills of 610,000 bales, largest ever known save in war months of March 1916 and May 1917.

BANK CLEARINGS—Check exchanges in country in January gain 5 per cent over February and 21 per cent over January, 1922; clearings outside of New York City gain 30.4 per cent.

EMPLOYMENT—January witnessed large increase in employment in important industries; iron and steel employment gains 50 per cent over year ago; automobile plants gain 65 per cent.

FREIGHT MOVEMENTS—Weekly carloadings continue to shatter all previous records; total for week ended Feb. 3 was 13 per cent over former peak for the same week in 1920.

SECURITIES—Bouyancy has prevailed in stock markets; fifty representative shares maintain high levels as trade outlook continues to brighten; bonds are firmer, also.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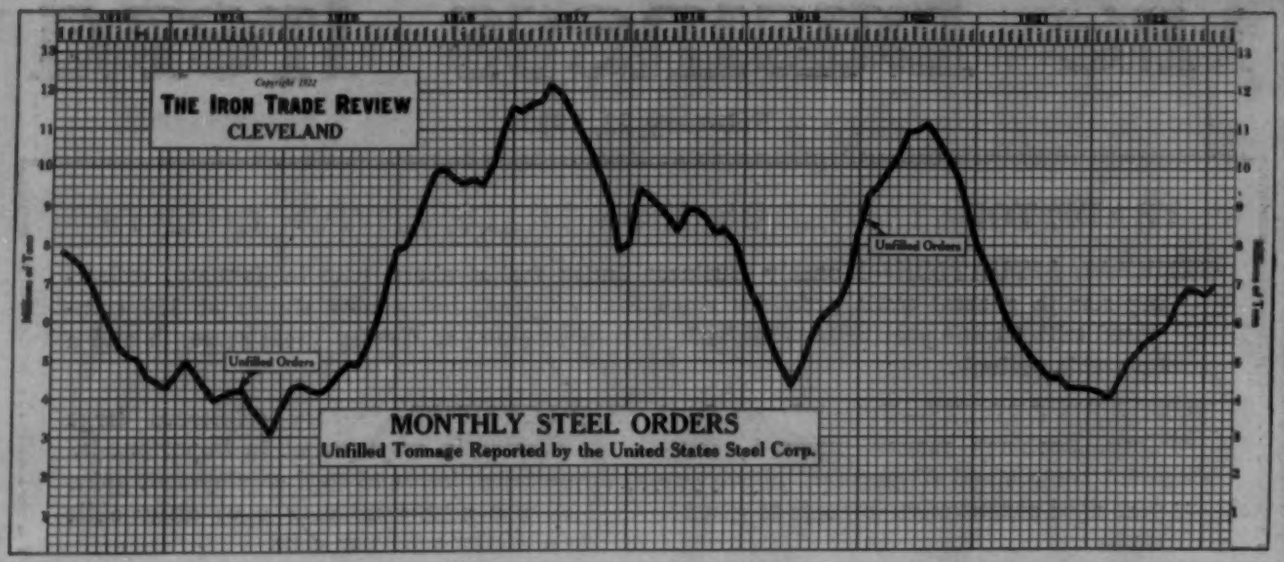
Coal Strike
April 1—Aug. 15
THE MONTHLY BUSINESS INDEX
Average for 1913 Taken as 100
Curve Shows Composite Average of Monthly Movements of Six Basic Trade Factors:
Building Awards in Square Feet (F. W. Dodge Reports for 27 States)
Pig Iron Production
Cotton Consumption
Coal Production
Freight Car Loadings
Bradstreets Index of Wholesale Prices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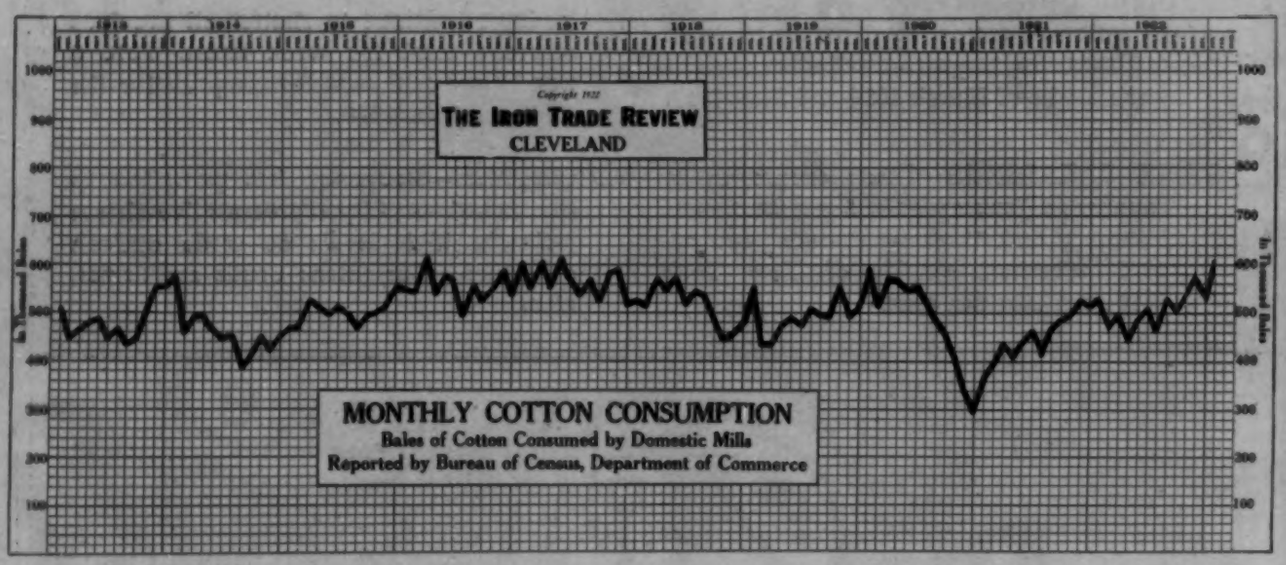
CLEVELAND
Unfilled Orders
Unfilled Orders
MONTHLY STEEL ORDERS
Unfilled Tonnage Reported by the United States Steel Corp.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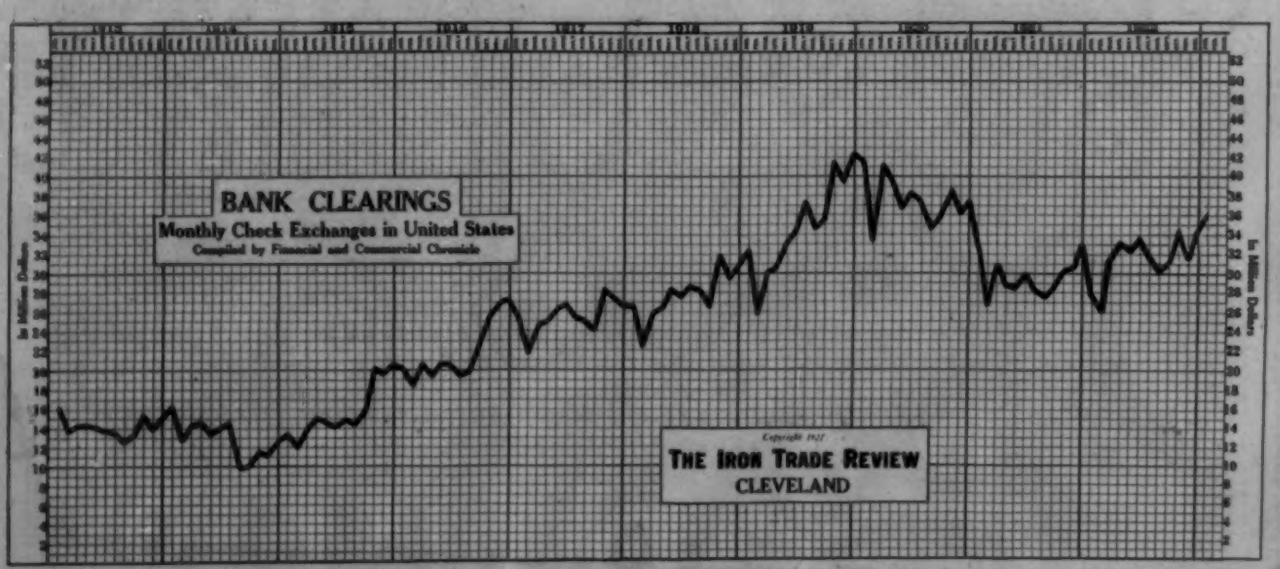
MONTHLY COTTON CONSUMPTION
Bales of Cotton Consumed by Domestic Mills
Reported by Bureau of Census, Department of Commerce


BANK CLEARINGS
Monthly Check Exchanges in United States
Compiled by Financial and Commercial Chronicle
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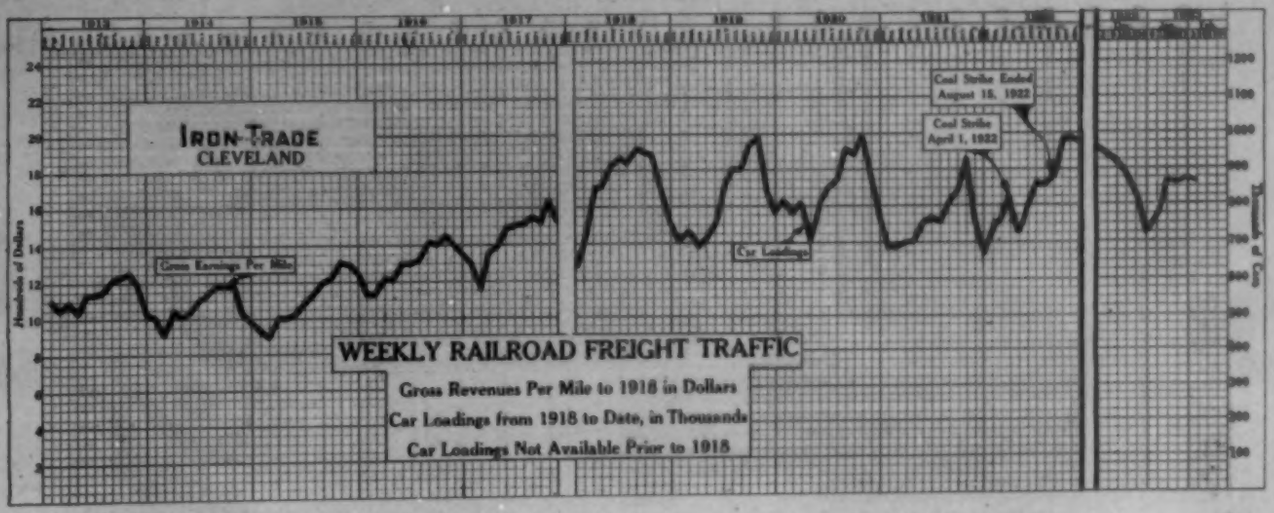
CLEVELAND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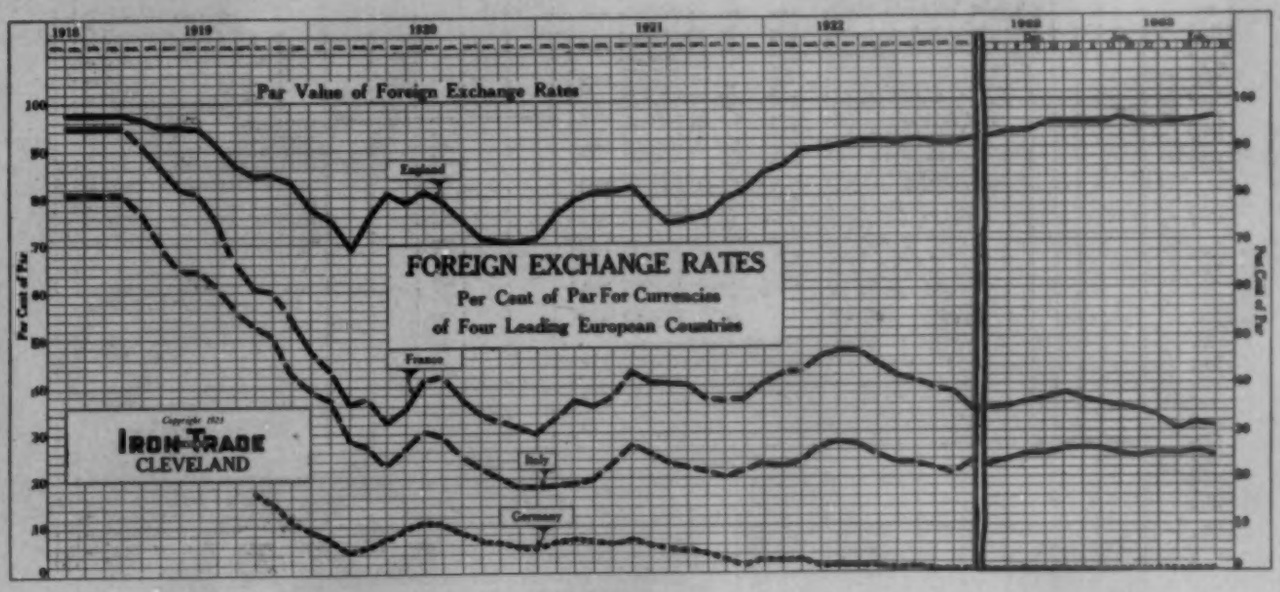
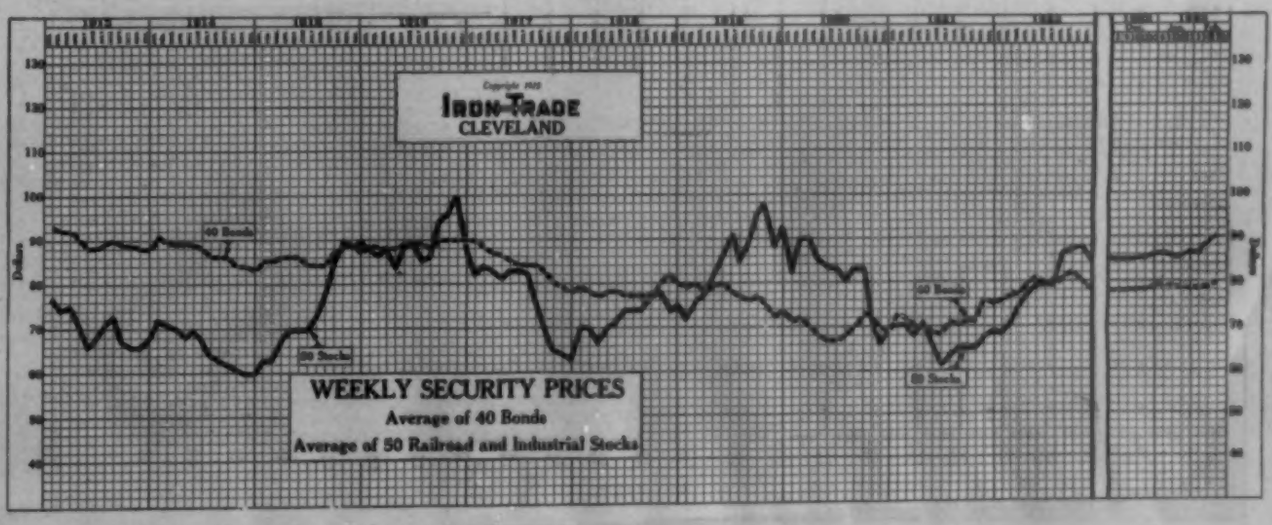
Coal Strike April 1, 1922
Gross Earnings Per Mile
Car Loadings
WEEKLY RAILROAD FREIGHT TRAFFIC
Gross Revenues Per Mile to 1918 in Dollars
Car Loadings from 1918 to Date, in Thousands
Car Loadings Not Available Prior to 1918


Par Value of Foreign Exchange Rates
England
France
Italy
Germany
FOREIGN EXCHANGE RATES
Per Cent of Par For Currencies
of Four Leading European Countries
IRON TRADE
CLEVELAND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CLEVELAND
40 Bonds
50 Stocks
WEEKLY SECURITY PRICES
Average of 40 Bonds
Average of 50 Railroad and Industrial Stocks

COMPARISON OF EMPLOYMENT IN IMPORTANT INDUSTRIES
U. S. Employment Service Reports
Iron and Steel and Products
491,812
Land Vehicles
TOTAL EMPLOYMENT
Reports From 1428 Companies in 65 Cities With 501 or More Employes
Metals and Metal Products
Railroad Repair Shops
Textiles and Their Products
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IRON TRADE
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In Thousands
July Aug. Sept. Oct. Nov. Dec.
Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec. Jan.
1921
1922

Steel Distribution in New England

Various Lines Into Which Product Is Manufactured Traced—Consumption of Bars, 587,000 Tons in 1922; Wire Products, 310,000; Rails 113,795—Value Is 6.8 Per Cent of Total for United States

BY HERBERT R. SIMONDS

THE tonnage of steel which is used annually in New England is a decidedly uncertain quantity in the minds of most iron and steel men of that district. This at first seems surprising, but as soon as a comprehensive study of the question is started many factors develop tending to make the compilation of accurate tonnages difficult. In the present article an attempt is made to approach this subject from several different angles so that one may check against the other.

The government has not published any steel statistics covering New England since the publication of the United States census of manufacturers of 1914. This volume does not take up in detail the consumption of steel in the different districts, but it does give some figures which may be used to check data secured from other sources. The estimate covering New England consumption is made up as follows:

In 1914 the total value of iron and steel production in the United States amounted to approximately $3,000,000,000. During the same year the total value of iron and steel shipped to Massachusetts amounted to 3.81 per cent of the total value of that produced in the entire country. By taking 3.81 per cent of $3,000,000,000 the value of iron and steel products shipped into Massachusetts is determined as $114,200,000.

Similar percentages are available for each of the other New England states and by extending these and adding the results, the value of iron and steel products shipped into New England in 1914 may be determined. This is worked out in Table 1, from which it is seen that the total value of iron and steel products shipped into the six states amounted in 1914 to $204,000,000. This figure has little bearing on the tonnage as there is no data from which the average per ton price could be estimated. The percentage figures, however, may be used as a rough check against other data.

If the value of iron and steel products used in New England in 1914 was 6.8 per cent of the value of all the iron and steel produced in the United States, it is reasonable to assume that the tonnage of steel used in the district in 1914 showed a somewhat similar relation to the total tonnage rolled in American mills. In the reports of the census bureau since 1914 the percentages of the total value for the different districts are not given. However, the statistical abstract for the United States for the year 1921 gives figures covering the value of products in the various New England states, and these tend to show that the district has at least held its 1914 percentage in the matter of iron and steel products consumed.

In 1914 Massachusetts had 17 per cent of the cutlery business of the United States and in 1919 it had 29.4 per cent. Tools showed a drop from 25 per cent in 1914 to 20 per cent in 1919, but this was offset by an increase in wire production of 10 per cent in 1914 to 15.1 per cent in 1919. The value of the wire produced in Massachusetts in 1919 was $24,000,500.

For the purpose of checking, it is assumed that the percentage of iron and steel used in New England as compared with the whole country has not appreciably changed since 1914. Figures compiled by IRON TRADE REVIEW show that the total finished steel output of the country for 1922 was approximately 22,000,811 gross tons. Taking 6.8 per cent of this gives 1,551,148 tons as the amount used in New England.

A large proportion of the steel shipped into the New England district is used in the manufacture of small articles such as shoe nails, eyelets, needles, pins, hooks and eyes, loom parts, typewriter parts, ball bearings, etc. It would be interesting to follow in considerable detail some of the different industries to show the tonnage which is used annually in the manufacture, for instance, of typewriters or needles. The way in which the steel output of the country is divided among principal consuming industries has been developed by E. C. Kreutzberg in a previous issue of IRON TRADE REVIEW. Thus in 1922 the automotive industry took 8.98 per cent of the country's steel, railroads took 11.01 per cent, the construction of cars and locomotives took 11.18 per cent, and machinery and tools took 2.83 per cent. These industrial divisions might be further subdivided to show the per cent used in New England under each division. This, however, is beyond the scope of the present analysis, except as it is incidental to the main steel divisions mentioned.

An analysis of figures furnished by one of the chief mill interests covering rails used in New England gives the following amounts as the average

The author is associate editor at Boston of IRON TRADE REVIEW.

Inquiry Conducted in Three Fields

FIGURES and estimates in this article covering the consumption of steel in New England are the result of an investigation carried on over a period of nearly a year in three fields. The first field of investigation is that of the steel companies and producers which ship into the district. In most cases these companies have co-operated, and in many cases figures have been taken from order books covering a year's sales. The second field is that of consumers within the district. Several hundred letters have been written to representative manufacturers in the various lines. These letters have asked for the annual tonnage used not only in the plants of the manufacturers questioned, but also for an estimate of the total used in New England. For instance, one large manufacturer uses 900 tons of sheets in the production of optical cases, and he estimates that the total tonnage in New England for this particular product is 1400 tons. The third field of investigation is that of government statistics and published records of various kinds including reports of transportation companies. When the recent mergers of the Lackawanna Steel Co. with the Bethlehem Steel Corp., and the proposed merger of Midvale Steel & Ordnance Co., Republic Iron & Steel Co. and Inland Steel Co., were attacked by the federal trade commission many important figures concerning the sale of steel by these various companies in New England were made available.

FIG. 1—STRAIGHTENING BARS FOR NEW ENGLAND MANUFACTURERS

annual requirements of the different roads: Central Vermont, 2000 tons; New York, New Haven & Hartford, 40,000; Boston & Maine, 25,000; Boston & Albany, 8000; Maine Central, 8000; Bangor & Aroostook, 2000; Rutland, 2000; total, 87,000 tons.

These figures are exclusive of frog and switch material and track fastenings. For steam rails the bolts and tie plates figure an average of 50 pounds to the joint which means a total tonnage of about 5½ per cent of the rail tonnage, and this gives 4785 tons to be added to the total.

Street railroads in New England use from 10,000 to 12,000 tons of girder rails a year and from 5000 to 7000 tons of tee rails, a total of about 17,000 tons. For track fastenings, due to the 60-foot rail used in street railway work, the additional tonnage figures a smaller per cent of rail tonnage than for steam roads. Using three per cent as the average figure this gives an additional tonnage of 510 tons. The total figure for rails and fastenings used in New England is about 109,295 tons.

Buy Frog and Switch Material

The tonnage of steel used in frog and switch work for the steam roads is difficult to determine. This material is bought against specification and the price per ton varies on almost every order. The Boston & Maine, the Boston & Albany, the New York, New Haven & Hartford, and the Maine Central railroads for a period extending over several years spent, for the four roads, an average of $250,000 a year on frog and switch material. For the years 1922 and 1923 specifications ran somewhat higher than this average. Other New England steam roads use about $100,000 worth of frog and switch material. This gives a total of $350,000 for frog and switch material for the steam roads. Frog and switch requirements of the street railway companies throughout New England vary so greatly from year to year that it is difficult to arrive at average figures. Purchases for the year 1922 based on cost were approximately as follows: Eastern Massachusetts Street Railway Co., $50,000; Boston Elevated, $150,000; Springfield & Worcester Street Railway, $40,000; Providence, $25,000; various cities in Maine, $40,000; principal systems in Connecticut, $75,000; miscellaneous, $75,000; total, $455,000.

Summing up, the steam roads and the street railroads, combined, spend approximately $800,000 each year for frog and switch material. The average of over 30 orders selected at random for steam and street railroads gives a cost of 9 cents a pound, and using this value the average annual tonnage of frog and switch material in New England figures about 4500 tons. The total under rails and fastenings is: Rails, 104,000 tons; fastenings, 5295; frog and switches, 4500; total, 113,795 tons.

Table I

New England's Annual Consumption

	Gross tons
Rails and fastenings	113,795
Bars	587,000
Seamless steel tubing	4,500
Wire products	310,000
Strip steel	200,000
Sheets	171,400
Plates	25,000
Structural steel	150,000
Blooms, billets and slabs	30,000
Hoops and bands	3,000
Total	1,594,695

Consumption of Bars

Under the general term bars the same difficulty is encountered as under the term sheets. An arbitrary division for the purpose of comparison is here made as follows: Cold-drawn screw stock and special stock; special machinery bars; alloy steel bars; concrete bars; common soft steel bars in rounds, flats and squares.

Cold-drawn bars are used extensively in New England by a wide variety of manufacturers, but principally by those making small tools and parts for the automotive industry. These bars are sold to consumers by warehouses within the district, by warehouses outside of the district, by producers within the district, and by producers outside so that accurate tonnages in this particular commodity are more difficult to estimate than in most other commodities.

A list of all New England warehouses selling cold-drawn bars and the approximate annual sales was prepared. These figures were obtained for the largest sellers by direct inquiry and for other sellers by comparison of estimates of various producers. This list gives the total annual sales of cold-drawn bars of

Table II

New England's Steel Output in 1920

	Gross tons
Steel ingots and castings.....	302,000
Finished rolled steel	304,596
Finished rolled iron	25,934
Steel furnaces and converters (capacity)	530,000

all shapes from New England warehouses as 13,500 tons. There are four companies in New England which produce cold-drawn bars and the normal combined production of these four concerns is approximately 50,000 tons. This is in addition to some companies such as the American Steel & Wire Co., which produce bars for their own use. It is probable that not over 5000 tons of the 50,000 produced at New England plants goes to warehouses. This would leave 45,000 tons to add to the 13,500, and in addition to this must be added the tonnage shipped direct to New England consumers from the mills of outside makers. Such producers handling cold-drawn bars for distribution in New England are relatively few and the total tonnage is obtained fairly accurately. This amounts to about 22,000 tons. The tonnage represented by the fourth class, namely, warehouses outside of New England serving consumers within the district is undoubtedly small, and as figures covering this are not available, this particular item is omitted.

Cold Drawn Bars

The total consumption of cold-drawn bars figured on the foregoing lines is 80,500 tons. The order books of one steel company were opened for inspection and a complete list of the New England consumers thus shown together with estimated annual tonnage for each consumer gave a total of 105,000 tons. Probably these estimates were high. For the purpose of this analysis, 90,000 tons is used as the total of cold-drawn bars used in the district.

Special machinery bars is a term covering high manganese, high carbon, and acid open-hearth steel. Material under this particular classification as distinguished from alloy steel bars is furnished to the New England trade largely by one company

Table III

Value of Steel Used in 1914

State	Per cent of total For United States	
Massachusetts	3.81	$114,200,000
Connecticut	1.24	37,300,000
Rhode Island	0.675	20,300,000
Maine	0.49	14,700,000
New Hampshire	0.41	12,300,000
Vermont	0.175	5,200,000
Total	6.8	204,000,000

so that the total consumption in New England is fairly accurately determined. It is relatively small and during the year 1922 reached approximately 15,000 tons.

Alloy steel bars are used in a larger proportion in New England than in most other sections of the country. The tonnage, however, is relatively small and because of this, tool steel, electric steel, crucible steel, and alloy steel bars are all considered here under one heading. Warehouse interests in New England handle annually about 2000 tons of these bars and direct sales from mills average about 20,000 tons making a total under this heading of 22,000 tons.

The consumption of steel reinforc-

FIG. 2—IN PLANTS SUCH AS THIS IN NEW ENGLAND 50,000 TONS OF COLD-DRAWN BARS ARE PRODUCED ANNUALLY

ing bars used in concrete work varies as building activity varies. Recently, however, highway construction has developed into a good market for this class of steel and as road construction is usually independent of building, this factor tends to cut down fluctuations. The four leading concrete bar interests in Boston submitted figures showing average annual sales over a period of five years which, for the four combined, totaled 21,500 tons. The tonnage handled by other selling interests in New England checked against mill figures gives an average annual consumption of 60,000 tons. For 1922 this was considerably exceeded and probably reached 80,000 tons.

Commercial soft steel bars are supplied to the New England trade by five principal producers and the average of estimates made by these five covering the total consumed in New England is 378,000 tons. This is further checked by going to the principal warehouses and consumers, although the number of New England commercial bar consumers is so great as to make an attempt at listing them almost out of the question. The principal consumers, however, are fairly well known, and these have been listed under different states and the totals thus obtained are as follows: 29 in Connecticut give a total of 210,000; 35 in Massachusetts give a total of 175,000; 14 in Rhode Island, 33,000, and 19 in Maine, New Hampshire and Vermont, 41,000, making a total for New England of 459,000 tons. The tendency on the part of a consumer when stating his normal consumption of any product is to exaggerate so that 400,000 tons is probably closer to the fact. The total for all bars is 587,000 tons.

Seamless Steel Tubing

A determination of the tonnage of seamless steel tubing used in New England is more difficult than that of some of the other steel commodities. An approach to the question may be made through the consideration of boiler tubing. At present there are approximately 220,000 registered and inspected steam boilers in operation in New England. It is conservative to assume half of these are tubular boilers which would give a total of approximately 22,000,000 boiler tubes.

Figuring the life of a tube as 10 years, this means a replacement of 2,200,000 tubes a year. As a safe estimate, assume that of this amount 10 per cent are seamless tubes. This would mean 220,000 tubes or a total of about 2000 tons consumed annually. New England has approximately 3300 locomotives in use, and this means an additional annual tonnage for tubes of about 400 tons. Bicycles and motorcycles are perhaps the next largest consuming lines for seamless tubing. It is safe to say, however, that every large manufacturing plant uses some seamless steel tubing in its operations. The total tonnage of seamless tubes consumed in New England is estimated by two authorities as about 5000 tons, while one steel interest thinks that 3000 tons would be closer. For this analysis 4500 tons is used.

Wire Products

New England uses approximately 1,500,000 kegs of nails annually or 75,000 tons. Most of this is shipped into the district in manufactured form. However, there are several concerns making nails in New England. One of these, the American Steel & Wire Co., has an annual capacity of 200,000 kegs. Conservative estimates place the annual consumption of fencing in New England at 5000 tons and of poultry netting at 2000 tons. The American Steel & Wire Co. has a capacity of 140,000 tons of wire rod, all of which is used at its Worcester plant. The Wickwire Spencer Steel Corp. uses 75,000 tons of wire rod at its plants in Massachusetts, and of this amount produces 80 per cent and buys 20 per cent.

As part of the production of wire within the district is made up from scrap and pig iron and part is shipped in the form of semifinished steel, the actual consumption of wire products is difficult to determine. If wire and nails are added to wire rods considerable duplication would result. Several companies, such as the American Screw Co., Providence, R. I., buy wire rods and from this make up their own wire. It is probable that 230,000 tons of wire rod is either made within the district or is shipped in from mills outside. To this should be added 80,000 tons for finished wire and finished wire products manufactured outside of New England and shipped in. This gives a total of 310,000 tons.

Strip steel is closely related to flat wire and grouping the two, hot-rolled and cold-rolled, the normal consumption in New England is estimated by the principal producers at 200,000 tons per year.

Sheet Consumption

Because of the large percentage of light parts and small articles produced in New England a tonnage of steel sheets is used out of proportion to the tonnage of heavier grades of steel. The order book of one of the principal companies furnishing sheets to New England gives the following diversified list of products where sheets constitute the principal material and which are manufactured in this district:

Ice boxes, gas stoves, auto bodies, optical case stock, range boilers, stove pipe, maple sugar and syrup containers, electrical sheets, radio instruments, ventilating machinery, skylights, textile machinery, metal lockers and filing cases, ferrotype plate, culverts, billposting, window boxes, ash and oil cans, poultry supplies, paint cans and pails, vegetable and fruit cans and other cans, office trays and furniture, car roofs and metal ceilings, railway lanterns, and hot water bottles.

One of the principal mills furnishing sheets to New England has submitted complete figures showing shipments over the last 10 years into the six states. The figures submitted by this company give tonnages under the two headings, sheets and tin plate. This particular company has a tin mill equipment reaching about 45 per cent of the country's total, but its proportion of New England business is considerably higher than this and is estimated to reach from 50 to 60 per cent of the total tonnage consumed. Assuming it to be 55 per cent, Table 2 is then made up giving the tin plate shipped into New England during the last 10 years. This gives an average annual figure of 55,381 tons of tin plate consumed in New England.

The blue annealed sheet tonnage is greater, and an average of the estimates of three principal sellers gives an annual tonnage of 66,000. Figures

Table IV

Tin Plates Shipped Into New England

	Gross tons
1913	46,000
1914	48,600
1915	62,300
1916	73,850
1917	64,890
1918	65,100
1919	44,200
1920	55,000
1921	38,490
Average for the nine years	55,381

Table V

Total Production and Consumption

	Total output in U. S. in 1922 gross tons	New England consumption 1922 gross tons	Percentage
Rails	2,564,000	113,795	4.35
Bars	3,945,000	587,000	14.8
Shapes and plates	6,420,000	175,000	2.73
Wire products	2,582,000	310,000	12.02

obtained from consumers of blue annealed sheets indicate that this is a low estimate. A single consumer, a manufacturer of domestic boilers, reports using an average of 6000 to 7000 tons a year in thickness from 10 to 14 gage. This tonnage is used in the manufacture of galvanized range boilers. Three other consumers of blue annealed sheets from which reports were received give their average consumption as 800 tons, 600 tons and 500 tons respectively.

The various producers of galvanized sheets agree rather closely that the annual consumption in New England is from 35,000 to 40,000 tons.

Blue annealed sheets are gradually taking the place of black sheets so that the tonnage of the latter has dropped off rather abruptly during the last few years and in 1922 probably would not reach 12,000 tons. The total under sheets then is: Blue annealed, 66,000 tons; tin plate, 55,400; galvanized, 38,000; black, 12,000; total, 171,400.

In 1920 the Bethlehem Steel Co. sold 1564 tons and the Lackawanna Steel Co. 2720 tons of plates in the New England district. During the same year the Midvale Iron & Steel Co. sold in New England approximately 10,000 tons, the Republic Iron & Steel Co. 15,000 tons, and the Inland Steel Co. 574 tons. These are figures contained in government reports in connection with merger discussions. In addition to these companies there are several other important independent producers and the United States Steel Corp. to consider. The average of figures given by leading producers indicates the total consumption of plates in New England to be 55,000 tons, from 25 to 30 tons of which are used in building construction and are covered in this report under the heading of structural steel. This leaves the balance of plates annually used in New England outside of structural steel as 25,000 to 30,000 tons.

Structural Steel

The capacity of the various fabricating shops in New England is a quantity which may be fairly accurately determined, but the average production of these shops is less certain. The capacity is close to 80,000 tons, and an average figure for annual production would be 50,000 tons. In addition to this, steel mills furnish a large amount of fabricated material direct to contractors and builders. Under this heading comes a large proportion of the steel bridge work in the district and the annual average is estimated by the leading interests to be from 50,000 to 60,000 tons. Warehouses within the district sell structural shapes for a large number of small buildings, plant additions and alterations, and their annual sales come to approximately 45,000 tons which brings the total under structural steel for the district to 150,000 tons a year.

Table VI

Distribution of Cold Drawn Bars

In New England:	Per cent of tonnage
Textile machinery	28.3
Machine tools	10.5
Chain manufacturers	9.5
Wrenches and small tools	8.7
Screw machine products	8.5
Electrical manufacturers	7.9
Automotive parts	4.76
Pumps and power machinery	4.76
Shoe machinery	4.1
Heavy mill machinery	0.68
Miscellaneous, including motorcycles, confectionary machinery, tannery machinery, mining machinery, scales, etc.	11.70

Blooms, Billets and Slabs

Steel shipments into New England in the form of blooms, billets and slabs is light. In 1920 the Midvale Steel Co. and the Republic Iron & Steel Co. together sold about 2500 tons of billets. Several plants within the district produce billets and the American Steel & Wire Co. plant at Worcester especially is a heavy producer. However, practically all the billets produced in New England are made up, either in the works where they are produced or in a nearby plant, into the forms of steel such as wire, nails, and bars. As the tonnage represented is covered in these latter forms, it must be omitted here in order to avoid duplication. The tonnage of billets and slabs shipped into New England and used in producing commodities such as forgings which are not otherwise included in this analysis is about 30,000 tons according to estimates of the chief consumers.

Hoops and bands for New England consumption are handled almost entirely by the warehouses, and the leading interests estimate that the annual average is approximately 3000 tons. Cotton ties are used to some extent for baling purposes, but the tonnage is small and information meager so that this item is omitted.

The grand total tonnage for New England as shown in Table 5 is seen to check fairly closely with the 1,551,148 tons obtained by taking 6.8 per cent of the conutry's total rolled steel production. It must be remembered that the different classifications listed in the foregoing analysis do not include steel which has been turned into manufactured material outside the district and then shipped in, such as machinery, steel furniture, die blocks, guns, steel vaults, special bolts and nuts, boiler valves and fittings, and railroad cars. On the other hand, the tonnage of wire and steel products manufactured within the district and shipped to other parts of the country is not deducted. The term "consumption" is subject to a difference of interpretation, but in this article is understood to cover the use of finished and semifinished material in the process of fabrication or manufacture. The exceptions are the items covering structural steel fabricated elsewhere and then shipped into the district, and some wire products.

Investigates Stock Flow in Blast Furnaces

The Minneapolis station of the United States bureau of mines has made a study of the lines of flow of stock in a blast furnace by the use of cardboard models filled with lead shot. The model was inclined so that the component of gravity acting downward on the shot would make their density comparable to that of coke. Shot were removed from places in the model where tuyere gas analyses indicated the coke is burned. Cokes assumed to differ widely in combustibility showed distinct differences in the arrangement of the shot used as markers as they passed down the model. The lines of the furnace also effect the manner in which the stock descends. Flat boshes show a tendency to hang on the walls. The method outlined has been used for testing the flow of stock in the experimental blast furnace proposed for the University of Minnesota.

Will Recalls History

A development of some interest in view of the controversy that has taken place with reference to the introduction of the bessemer process into the United States, is the filing of the will of Francis Baylies Griswold at the Hall of Records, New York. In providing for a nephew and grand-nephew who bear his father's name, he said: "It is my earnest desire that the name of my father, John A. Griswold, may be perpetuated. He was a distinguished citizen, statesman and patriot. He was the first to introduce the bessemer steel process in the United States, and with John F. Winslow, through John Ericsson, built the MONITOR which in its first trial trip, and before it had been accepted or paid for by the United States, fought and vanquished the MERRIMAC."

Outlines Steel Sheet Cost System

Expenditures Are Governed by Arranging the Card of Accounts in the Detail Necessary to Control Major Operations Within a Department—Cost Keeping for Sheets Is Discussed in Detail

BY KEITH B. WOODS

COST accounting as applied to the iron and steel industry has a great many ramifications. One of the most important features of a good cost system in the manufacture of iron and steel sheets is the control of the expenditures which is made possible by laying out the card of accounts in complete detail in natural control units. These units are further subdivided in the detail necessary to control major operations within a department and also considering the fact that costs are wanted on various pieces of equipment over extended periods.

If the control is divided within a department two or more sections, or subdepartments, are made. For instance, all repairs and maintenance are under the control of the superintendent of maintenance, who is responsible for keeping the plant in repair and operation. As all departments and production centers have repair and maintenance charges, such departments or centers are in two sections, namely, those under the control of the maintenance superintendent, and those strictly under the control of the department head himself. The accounts, of course, follow one another on the card of accounts and are connected to a total for the department on the cost sheets. This practice places a definite responsibility on a particular superintendent or foreman and enables expenditures to be controlled.

Charges Carried Separately

All mechanical charges are made up on mechanical work order cost sheets, carried separately under what is called the mechanical control account on the general ledger. The cost department carries all detail connected therewith. The detail may be divided as shown in Table I. This control is closed out monthly and never carries any balance into the next month. The orders in Table I in their numerical sequence are closed out at the end of the month as shown in Table II.

A summarized "Monthly Report of Mechanical Expenditures" covering all items listed in Table II is made out, copies going to various executives interested.

As the work order expenditures in a steel plant are heavy, full control of them is secured as follows:

1.—When the work order is made out a copy immediately is sent to the superintendent being charged notifying him of that fact. By this expedient any errors in wrong and final charges are corrected and any unnecessary expenditures are stopped.

2.—When the order is completed a copy showing cost of labor, material, overhead and total is immediately sent to:
- a—Superintendent of maintenance.
- b—Shop foreman who issued order.
- c—Superintendent of department being charged. Here is a control in the natural unit, a work order, in which the work was done.

3.—The cost department detail copy of the work order is finally filed away in card of account order, subfiled by work order number for instant reference in case any item on the regular cost sheets is questioned.

All card of account items are coded by numbers and a sorting and tabulating system is used for the collection of all expenses. An example of coding, which applies through all items in the card of accounts, is as follows:

4150-76274

		: : :	Signifies Distribution Class
: :	: :	"	Method of payment
: :	:	"	Cost Sheet Class
: :		"	Item No. on Card of Accounts
:		"	Department Number

The items will appear on the cost sheets according to this class, examples of which are nonproductive labor; repair labor; repair material; etc. If it is desired to make further subdivisions and show a specific item then the sorting and tabulating is further carried from the cost sheet class to the item number of the card of accounts.

The method of payment is either a fixed charge per month, or per day, per hour, per ton, etc. Idle time expense is determined by sorting for fixed charges in each department.

Distribution classes are the groups into which the expenses of each department are sorted to be distributed to accounts or product participating. Examples include charge tonnage; production tonnage; number of batches or heats, etc.; actual equipment hours; standard equipment hours, and square feet, etc.

Each department carries its own distribution classes. In all distributions an attempt is made to have them natural or according to the way they are used, for instance, buildings on a square foot basis, electric power on a kilowatt hour basis, oil spread on the surface of a sheet on a square foot basis, etc. Unless this general plan is followed the costs are hardly worth the paper on which they are written. While there is some opposition to this plan, nevertheless, facts are facts—and costs should be facts. Any arbitrary way of distribution other than the natural way is not a fact. It is admitted, however, that where items are small and unimportant too much continuous time and expense should not be wasted going into ultra-refinements. All cost keeping should be based on common sense.

Service Cards Used

Labor is collected in one of four ways, namely, departmental daily force reports, job service cards, assignment job service cards, gang job service cards. Departmental daily force reports are used for daily jobs that do not change and that are not chargeable to more than one card of account item. From these a tabulating card is punched by the timekeeping department and sent to the cost department. The three service cards previously mentioned are used where the work is likely to be on any number of jobs during the day or where the work is done entirely on orders. They practically are identical, the assignment card being used mostly by a centralized labor department for assigning men to various other departments. This is due to the necessity of maintaining a labor supply. The gang service card is used where two or more men are working on the same order or card of account item.

The labor service cards are used for scheduling and are made out in triplicate, two carbon copies folding over one tabulating card copy. This card is consequently a dual one, the information being written thereon and the card punched from this writing. As

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soon as the cards are rated and extended by the time-keeping department one of the carbon copies is sent to the department superintendent being charged; one is returned to the department from which it was issued; and, the tabulating card copy is sent to the cost department.

Payroll Balanced Daily

Daily balances of the payroll are made. All pay for the week ends on Saturday night and the payments for the week are made the following Tuesday to Friday inclusive. All payroll cards are in the hands of the cost department by the third of the month following, as are also all material requisition cards.

Material requisitions are made out in three copies, exactly as the labor service cards and sent to the same persons. Due to a local condition of machines the cost department in this case punches the information on the tabulating card copy.

Department cost sheets are made out monthly from all the expense tabulating cards originally prepared for each and every department according to the card of account department number, two copies being ultimately typed—one for the general manager and the other for the treasurer or works manager. The latter copy eventually reaches the superintendent of the department interested. The main divisions of these accounts are:

1. GENERAL OVERHEAD.
   - Administration expense.
   - Selling expense.
   - Management expense.
   - Miscellaneous operating overhead.
2. RESERVE FOR REPAIR ACCOUNTS.
3. SPECIAL SERVICE ACCOUNTS.
   - Locomotives.
   - Locomotive cranes.
   - Auto trucks.
   - Teams.
   - Tractors.
   - Road rollers, etc.
4. SHOPS OVERHEAD ACCOUNTS.
   - Machine shop.
   - Blacksmith shop.
   - Riggers shop.
   - Welding shop, etc.
5. FACTORY OVERHEAD ACCOUNTS.
   - Various machine and cost groups.
6. FOUNDRY OVERHEAD ACCOUNTS.
   - By operations.
   - General overhead.
   - Molding.
   - Casting.
   - Cleaning and shipping.
7. MATERIAL HANDLING ACCOUNTS.
   - Scrap.
   - Pig iron.
   - Limestone, etc.
8. SERVICE ACCOUNTS.
   - Steam.
   - Electric power.
   - Light.
   - River pumping station.
   - Hydraulic, etc.
9. PRODUCTIVE OPERATIONS.
   - Coal mining.
   - Blast furnace.
   - Coke ovens.
   - Open hearth.
   - Blooming mill.
   - Bar mill.
   - Sheet mills.
   - Sheet common finishing.
   - Sheet special finishing.
   - Warehouses and shipping.

I. GENERAL OVERHEAD. For convenience in showing on the cost sheets general overhead accounts are carried under the manufacturing account for the month, the first three items being charged to their respective accounts on the general ledger. Miscellaneous operating overhead is comprised of general overhead departments and items applicable to all works, for example, such departments as works manager office, general superintendent office, betterment department, and other departments of a strictly operating character. This account is carried into a suspense inventory account and charged to all products at the point of shipment.

II. RESERVE FOR REPAIRS ACCOUNTS. The amounts in these accounts are special repairs which frequently are heavy and fluctuate violently from month to month, having little or nothing in common with the tonnage produced in that month in which the repair occurs. Examples would be "Reserve for Annealing Boxes and Bottoms," "Reserve for Galvanizing Pots," etc. The actual expense for the month is charged from the cost sheets to the corresponding general ledger reserve account and from there rated back to their specific card of account items on the cost sheets each month. This rate is established by past practice and is mostly on a production tonnage basis.

III. SPECIAL SERVICE ACCOUNTS. These accounts are for individual units or groups of units if of the same size, etc. The actual expense on the cost sheet for the month is charged into its corresponding suspense inventory account and is rated out from there on the last six months' rate to the various card of account items and work order cost sheets. In these cases a service order for such service is made out in three copies, two carbons folding over a tabulating card (similar to the labor service cards previously explained), which are used for scheduling the work. When the work is completed the service orders are sent to the cost department where they are rated, extended and used as overhead cards. One carbon goes to the schedule clerk for his permanent file, the other carbon being sent to the department superintendent being charged. The tabulating card is punched and used in the same manner as the labor service and material requisition cards. In the card of accounts for these units appear items of delay and idle time hours, such as coal and water hours, repair hours, hours of no work, etc. Cards are made out daily charging each delay item when it occurs. Delay cards are not rated, because such delay hours including those due to no work are not considered in the actual hours worked. Idle time hours due to no work are used as a ratio to possible hours for securing that proportion of fixed expense chargeable as idle time cost. This expense is deducted from the total expense to form the amount of expense against the total actual hours operated. All possible time is accounted for on the cards, whether the unit of equipment is operating or not. If the unit ordinarily is active, say 10 hours and it works five hours overtime in a day then the possible time for the day is 15 hours and this time must be accounted for on the cards.

IV. SHOPS OVERHEAD ACCOUNTS. These accounts are for all maintenance shops throughout the plant. In this case also the actual expense for the month is charged into its corresponding suspense inventory and from there rated out on the last six months' rate to various work order cost sheets. The two carbon and one tabulating card copy are made out in the cost department and disposed of in the same way as outlined in the preceding group of accounts. At the end of the year, both in the special service and shops overhead inventory suspense accounts the balance whether black or red is written out to the profit and loss sheet. But the last six months' rate still is continued consecutively, month by month, in the next year.

Overhead Accounts Are Rated

V. FACTORY OVERHEAD ACCOUNTS. These accounts are composed of various cost groups and machine units and are handled similar to the special service account through the corresponding inventory suspense accounts. They also are rated on the last six months' basis but in this case the overhead is carried directly to the product cost sheets, which are on an order basis. Standard product is covered by an order for each kind of product in suitable quantity to make within a reasonable period. Special orders cover all other product and a cost sheet is made up this way. Most of these overhead accounts are on a machine hour basis due to the preponderance of machinery, though a few are on a productive labor (operator—not helpers) basis.

7. MATERIAL HANDLING ACCOUNTS. These accounts are closed out from the cost sheets to the various material accounts affected, principally raw stores, in the stores inventory. These expenses cover handling on to the piles, etc., but do not cover delivery to the department, the cost of the lat-

Table I

Detail of Mechanical Control Account

1. Subwork orders, in turn charged to
2. Card of Account (Manufacturing Account) monthly standing work orders.
3. Card of Account (Manufacturing Account) individual work orders.
4. Special Repair work orders.
5. General Ledger Accounts work orders.
6. Outside Parties work orders.
7. Employes work orders.
8. Construction Orders work orders.
9. Spare Orders work orders.
10. Store Stock work orders.
11. Real Estate work orders.

ter being charged to the department direct.

8. SERVICE ACCOUNTS. The power which makes all work possible is the boiler house in a centralized power plant. The steam from the boilers is taken directly to the power station where it is used chiefly by the blooming and bar mill engines. The exhaust from these engines, as well as high-pressure steam, is used by turbines which are directly connected to large generators, furnishing electric power to drive all electrical equipment and to illuminate the entire plant as well. A switchboard is equipped with switches and meters which keep a record of the amount of power used by each separate unit of the plant. Reports of all power, etc., used are sent to the cost department monthly for distribution purposes. In this case there is a counter-charge, where percentages of the various units are charged against each other. Steam uses electric power and electric power uses steam, and so on through seven or eight of these accounts. These run through a counter-charge sheet, thence through the distribution journal to the various cost sheets.

Production Costs Listed

9. PRODUCTIVE OPERATIONS. The costs of productive operations appear in the final operation cost sheets, previous to and including the charge to the various products. * * *

Before discussing the cost accounting for sheets it might be of interest to briefly describe the various operations in manufacture. The sheet bars are charged into pair furnaces for heating to a rolling temperature. The pair heating furnace gets its name from the fact that the bars are worked in and out of this furnace in pairs. When the bars have been heated to the proper temperature they are brought out of the furnace and pulled over to the roughing mill where they are given a number of passes to prepare them for the finishing rolls. In the majority of cases it is not possible to make finished sheets from the bars as they come from the pair heating furnaces. Therefore to facilitate the handling and increase the tonnage, a regular working scale for different gages has been devised.

In rolling light gage sheets the bars are roughed down, the resulting rough sheets matched, and then placed in sheet furnaces. When heated to the proper rolling temperature they are given one or two passes through the rolls. After this, they are opened and doubled, that is, each sheet is bent together at one-half of its length. Heavy sheets are finished either singly or in pairs, lighter ones are doubled and finished in packs of four, six or eight sheets to the pack. After the packs have been rolled to proper length plus the allowances made for uneven edges, they go to the hot mill shears for trimming to size. After being trimmed, due to the fact that the sheets have a tendency to stick together during the rolling process, they go to the opener who bends up a corner of the pack, which generally causes the sheets at that point to spring apart sufficiently to allow the insertion of his tongs, when the sheets are separated one at a time.

Because of the buckled and wavy condition of sheets as they are delivered from the hot mills, one pass on cold rolls is given each sheet to flatten it. The rough treatment, to which the iron and steel sheets are subjected up to this point, has so disarranged the grain structure and molecular construction that the sheets are of but little use for any practical purpose. To overcome this condition and secure softness and ductility it is necessary to resort to annealing, which is a lengthy heat treatment under uniform temperature. The sheets are stacked on annealing pans or bottoms; a large cover is placed over them and carefully sanded around the bottom to exclude air. This is placed in a large annealing furnace, thermostatically controlled by pyrometers, for its long rest under uniform heat temperature. When this operation is finished we have a common black sheet which is a saleable product.

A large proportion of these common black sheets are, however, galvanized in order to give additional protection against weather and other wearing conditions. In treating the surface of the sheets for coating or other special finishes, the first operation is a thorough cleansing by the pickling process. The sheets are placed in racks and lifted by a carrier moving in a circle from bath to bath, at the same time being agitated up and down, first through an acid bath then through two washes of water, thus removing all scale, dirt and surface contaminations. After being pickled the sheets for galvanizing are conveyed in lifts to storage tanks containing hydrochloric acid. This acts as a further cleansing agent and is of material assistance in preparing the sheets for coating.

Amount of Coating Is Controlled

The sheets then are lifted, one by one, from the tank and run through a set of rolls, passing through a flux box, and then through the galvanizing pot proper, which contains molten spelter, the coating material. As the sheets pass through the molten spelter a coating is deposited, but the amount has not been controlled. Therefore, as the sheets pass out of the pot, they go through a set of "exit" rolls, which together with the rate of speed at which the sheets are run through the pot determines the weight of coating. The coated sheets leave the galvanizing pots on chain conveyors to solidify the spelter coating, thence through roller leveling machines to flatten, on to an inspection table where they are carefully gone over by the inspector and placed in cooling racks, the defective sheets being offset at the right end of the rack. If the defect is in the coating these sheets are then sent back to be stripped of their coating, after which they again are treated through the various processes previously outlined.

In the manufacture of high-grade specialty sheets which require a rigid surface inspection, it is necessary to have the surface of the bars clean before rolling them into sheets which is done by means of a bath in sulphuric acid. The acid is then washed off with lime water, after which the bars are ready for the sheet mill furnaces. In the manufacture of ordinary sheet finishes, such as black and galvanized, the pickling of the bars is not necessary. In the majority of cases the requirements of special finish sheets are smoothness and density of surface. To secure this condition they are given a number of passes through finishing cold rolls, the surfaces of which are highly polished. All sheets for auto-

mobile bodies and fenders, metal furniture, cabinet work, locomotive jackets, stoves, etc., undergo this treatment so that a good finish on the enameled or painted surface may be secured.

Finishing cold rolls produce a slightly buckled condition and it is therefore necessary to roller level them. Roller leveling machines consist of a series of small rolls, the top set staggered over the bottom set. The weaving motion produced on the sheets automatically levels them sufficient for most purposes. Sheets for the manufacture of metal furniture, cabinets, etc., must be dead flat, for the slightest weave or buckle will be greatly augmented in the final finish. Therefore stretcher leveling is resorted to. This process consists of pulling apart by hydraulic pressure two large jaws, which grip the ends of the sheet. A high standard of inspection is maintained, the sheets being minutely examined by experts for surface defects. The defective sheets are thrown out and sold as such.

Oil Prevents Surface Defections

The highly polished surfaces of high-grade sheets, some of which are almost as smooth as glass, would become scratched and marred in shipping and if subjected to moisture would rust, unless thoroughly protected. To provide against this oiling machines are used, through which the sheets are run and coated with a thin film of compounded protective oils. For some purposes sheets must be exact to size and square. It is not possible to get them in that condition by shearing the sheets as they come from the hot mills, as pack shearing could not be made accurate, and in addition to this fact the material is generally in a buckled condition. Subsequent operations also distort the sheet to a certain extent, therefore resquaring on shears especially built for accuracy is performed.

The control of all sheets through the various operations is by standard finish names and routings, or by special orders where a sheet does not follow a given routing. It does not always follow, however, that these standard routings are adhered to. There are conditions of extra operations, operations sometimes omitted, retreatment in various operations and in some instances diverting the sheets from one finish to another during the processes. All of these except the latter condition are necessary to bring the sheet to the desired condition to meet necessary requirements of a particular finish or a customer's special requirements.

The roller on the hot mills receives a copy of the hot mill schedule card, which shows the gage, size, finish, etc., of the sheets to be rolled. The first copy of this schedule card has already been forwarded to the bar mill to serve as an order for the bars required. As the items shown on this order are rolled the roller enters the necessary information to the pair slip, which is made up in triplicate. This pair slip is a production sheet of each turn of each hot mill, either sheet or plate.

Sheets Are Assigned by Lifts

All copies of the pair slips then are sent to the shearman, who records thereon the number of good sheets, cutdowns, cutups, etc. He then forwards the copies to the sheet mill weighmaster. The control of sheets through all operations beyond the hot mill is by lifts. A lift of sheets is a quantity easily picked up by a crane and varies from a few thousand to 10,000 or 12,000 pounds, in some instances more. As the material is weighed off the hot mill shears, the weighmaster enters the weight by lifts and he assigns the lift number to the pair slips and makes out a lift schedule in triplicate. The original and duplicate are forwarded to the schedule office where additional copies are made out for each operation thereafter. The triplicate, which is a hard card, accompanies the lift through all operations.

Of the three copies of the pair slips the original is sent to the time-keeping department, where it is used for making up the tonnage payroll. The duplicate is retained in the schedule office where it is used as a posting medium for progress records. The triplicate is sent to the operating chief clerk (who takes certain information therefrom) and then to the cost department. The cost department uses this record as a basis for all hot mill production reports as follows:

When the pair slips are received by the cost department two tabulating cards are punched. One is a monthly production card, which shows only the month's production, and the other, a check file card, is a continuous record of all operations from and including the hot mills irrespective of the month in which performed. These two cards are used for all operations and the operation numbers and change of weights as they occur are identically punched on both cards. As the schedules come in for succeeding operations on each lift these cards are pulled from their files and the operation number and new production weight (if any) is punched thereon.

In cases of retreatment separate cards are punched and where the retreatment is more than one pass in the same operation the weight is multiplied by the number of passes. The monthly production cards are kept in a current file. Hot mill weekly production reports by "finish" for the operating department are prepared from them each week. At the end of the month regular monthly production reports for each operation are drawn off by finish and gage and totaled as to each operation. At the same time the number of square feet and of distribution factors applicable to each gage of each finish are put against the corresponding item and totaled.

Entered on Cost Sheet

The total production for each operation and its average gage then is entered on the operating cost sheet for that operation and the total quanity of each distribution factor for each operation is entered on its corresponding process inventory, awaiting the total value of that distribution factor from the operating cost sheet, which as soon as taken from the expense tabulating cards is entered against the above quantity in the process inventory. These process inventories, as soon as the available is determined, then are ready for pricing of finished

Table II

Procedure for Closing Out Items in Table I

(In Numerical Sequence)

2. To Card of Account (Manufacturing Account) cost sheets.
3. To Card of Account (Manufacturing Account) cost sheets.
4. To Card of Account cost sheets and other general ledger accounts through the medium of a summarized "Report of Special Repair Orders." (Copies of this report are sent to all executives interested.)
5. To General Ledger miscellaneous accounts.
6. To Cost of Work for Outside Parties-in-process. When the order is completed the cost department vouchers against miscellaneous cost of sales (Outside Parties.)
7. To Employes' Ledger. (Deducted from their pay.)
8. To Construction Orders-in-process through a special "Report of Construction Order Expenditures for the month." (Copies of this report are sent to all executives interested.) When the construction order is completed it is vouchered to the various fixed asset accounts concerned.
9. To Spares Orders-in-process. As completed they are vouchered by the cost department to stores inventory.
10. Store Stock work orders. These are handled the same as item No. 9.
11. To General Ledger Other Income Account. (Real estate expense.)

stock cost cards as described below.

The check file cards mentioned above are kept in a process check file until the last operation has been performed on the lift, when they are filed in what is called a stock finished in current month file. From these cards the monthly finished stock cost cards are made up. At the end of the month all the check file cards are sorted by finish, grade and gage, and subsorted by operation number; a set of cards for a given gage of a given grade and finish are run through the tabulator and entered on finished stock cost cards, one for each operation.

This card is for tabulation purposes but the only punched information thereon is the "sorting" information. The tabulating information cannot be punched owing to the fact that it is too voluminous for the capacity of the card. The cards are numbered consecutively, as the information is taken off the tabulator from the check file cards, starting with number one for the first operation of the first finish and the last number ending up with the last operation of the last finish.

Entries Are Checked

As rapidly as each set of these cost cards are made up from the tabulator they are turned over to a clerk who proves the written entries to the tabulator total and then figures the scrap, adjustments, if any, seconds on inspection operations, etc. They then are passed on to another clerk who rates for quantity of distribution factors where required and extends such quantities. The cards now are ready for pricing from the process inventories and this is done through a price sheet which previously has been drawn off from these inventories. When priced the cards of each set are extended and an adding slip made of the total expense on each card and at the same time a grand total of all expense for the set, this latter being then entered, together with the final production weight of prime sheets which appears on the last card of the set, into a report of finished stock costs which is as follows:

FINISHED STOCK COST REPORT

Gage (in Numerical sequence)	Quantity	Per 1000 pounds
....	....	....
....	....	....
....	....	....

This report then is typed and sent to the general manager and works manager. The pencil copy is used to charge the production into the finished stock inventories which are kept by each gage of each finish and grade. The finished stock cost cards then are sorted by operation number and each operation has its distribution factor quantities and corresponding values which are totaled on an adding machine. These totals are entered on a "Summary of Credits to Process Inventories," which is used to relieve each process inventory in one amount for the month. It also is matched against the report of finished stock costs, with which it must agree, thereby proving that all the additions were made correctly. The cards then are sorted back to card number, which puts them in the order that their totals appear on the report of finished stock costs. Thus they are ready for instant reference if needed.

If any costs appear out of line on the report of finished stock costs then the corresponding cost cards are consulted and in short order a detailed cost sheet showing the bars used and the essential information of each consecutive operation thereon is made up and presented to show the reason for the discrepancy. This practice carries out the principle of exceptions when a mass of cost sheets are not made up to remain, in most cases, undigested by those executives who should have a comprehensive report of costs in brief form. This is obtained in the report of finished stock costs previously outlined which shows the gages vertically and the finishes horizontally.

All costs of a given finish are made up to include the last regular operation. If addition operations are given beyond this for which the customer pays an extra, such as resquaring, stretcher leveling, etc., then material is drawn from finished stock inventory at the last regular operation and the above procedure is followed to produce a cost with these extra operations added. Cost of sales is drawn from the finished stock inventory by each gage of each finish and grade, to which is added warehouse and shipping cost, etc., to form the total manufacturing cost of sales.

Features Entailed in Cost Systems

Different phases of iron and steel manufacture entail probably every known kind of cost system and many special conditions. Even in the factory on some few special orders the condition of joint costs obtains. A few of these special features include scrap loss, seconds, spelter dross and idle time expense.

Production of scrap is added to the prime cost of the material by allowing credit at current market price (at the time of such production) for the class of scrap produced. Practically all this scrap is returned to the open hearth to be remelted. Mill equipment scrap, of course, is credited to operating cost as the replacement is charged as an expense. In some cases construction work receives the credit.

From the inspection operation, second grade sheets, not good enough for the customer's requirements or defective are thrown out and sold as seconds. As in the scrap produced, the loss occasioned in not producing good prime sheets is charged against the prime stock by giving it credit for the seconds at market value.

In the galvanizing of sheets spelter is used and a dross is produced in the pots. There is a recovery of approximately 80 per cent spelter in this dross. The galvanizing coating operation is given credit for this amount when the pots are cleaned. Spelter is controlled through tests which are made every hour on the sheets going through the pots. These tests submitted to the cost department monthly form the basis of the distribution of the spelter to the sheets, the total spelter used being measured as follows: Height of spelter in the pot at beginning of month, plus spelter added during the month, less height of spelter in the pot at the end of month, equals spelter used during the month. Necessarily the height of spelter in the pot is converted to weight of spelter in this formula.

From each department idle time expense is collected on one cost sheet in departmental number order to form a summarized statement. Copies of this information are sent to the general manager and the works manager. From this summarized cost sheet the expense is charged directly into profit and loss monthly.

Publish Report Favoring Metric System

A saving representing more than 10 times the initial cost of changing from the present system of weights and measures to the metric system is shown as a possibility in the annual report of the Metric association, 156 Fifth avenue, New York. To refute the arguments of opponents who maintain that the expense of change is prohibitive, the report quotes Theodore Miller, works manager of the De Laval Separator Co.

"About 1910 we changed to the general use of the metric system throughout our plant," said Mr. Miller. "The advantages gained by the use of so simple a system as the metric have been worth to us more than ten times the slight initial cost required to make the change. By placing on our

drawings the expression, 'Dimensions in millimeters' we follow the practice recommended by the Metric association and avoid the necessity of placing even the familiar abbreviation 'mm' after figures."

For many years Dr. Arthur E. Kennelly, professor of electric engineering of both Harvard and the Massachusetts Institute of Technology, has trained his students to do their work in metric terms. The report quotes him as saying:

"In the study of the principles of electrical engineering a knowledge of the underlying metric system—the meter, liter and gram system—is required. It is probably correct to say that all the colleges in the United States which teach chemistry, physics or electrical engineering, either call for or instill a knowledge of the metric system among their students. In view of the fact that electrical engineering has already introduced units of the metric system into widespread public use, there is no question as to whether the system will be generally adopted in the United States. The only question is how soon it will become generally adopted."

The report of the Metric association calls attention to resolutions favoring adoption of the metric system passed early in January by the American Association for the Advancement of Science, in Boston, and points out that the system played an important part at the meeting of the National Council of the Chambers of Commerce of the United States, in Washington last year, when it was voted to submit the question of adopting the new system to a referendum.

Reducing Mineral Waste

"Proposed Method for Reducing Mineral Waste in the Wisconsin Zinc District," is the title of a technical paper just issued by the federal bureau of mines, Washington. In addition to presenting work done toward reducing mineral waste—principally zinc—attention also is called to the possibilities of saving and utilizing the lead, marcasite and limestone tailing. The investigation was not limited to the losses in the sludge and fine tailings but included the treatment of jig concentrates by flotation in order to get a higher recovery of zinc than is obtained at present by roasting and magnetic separation.

Demonstrate Machine for Cutting Molding Sand

A unique method of educating foundrymen to the advantages of the sand cutting machine has been adopted by the American Foundry Equipment Co., New York. A specially built commercial body on a standard automobile chassis is used to transport a standard size cutter about the country for demonstrations at various foundries. The machine is dropped off at the foundry, the power cable plugged into the electric circuit, and the machine is ready to cut the sand.

The cutting is accomplished by a number of blades mounted on a cylindrical form. The blades revolve rapidly and as the sand cutting machine moves slowly forward astride the sand heap, these blades blend the sand and disintegrate all of the lumps. The machine travels under its own power with the operator doing the guiding. This demonstration car has been traveling in the Middle West for several months. A schedule for an extended trip for this spring is now being prepared.

The welding shop of the Metal & Thermit Corp., Jersey City, N. J., has been completed for making welds on light sections with oxyacetylene and electric processes.

Discusses Blast Furnace Design and Practice

Details of blast furnace practice were discussed by B. D. Quarrie, general manager, Otis Steel Co., at the fourth meeting of the series on the iron and steel industry being held under the direction of the Associated Technical Societies of Cleveland. Mr. Quarrie, who was introduced by Dr. F. H. Van Horn, Case School of Applied Science, outlined the various raw materials used in the blast furnaces and touched briefly on the principal sources of supply.

He described the principles of operation, stating the chemical reactions, and explaining the action of the charge as it approaches the hearth. The importance of slag and its function in the process, were outlined. The speaker also discussed the design and construction of furnaces, and commented on some of the recent developments in blast furnace operation.

The paper was a concise and thorough outline of the metallurgical, chemical and mechanical aspects of blast furnace operation. Following a discussion of Mr. Quarrie's paper, two reels of films showing the making of pig iron and steel, were exhibited through the courtesy of Rogers, Brown & Co., Cincinnati.

Leather Belting Output

Output of leather belting in 1921 was valued at $15,727,000, compared with $40,481,000 in 1919 and $23,036,000 in 1914, states the census bureau, Washington. Reports show that 159 establishments were making leather belting in 1921, employing 2422 persons, against 164 establishments with 4019 persons in 1919 and 141 establishments with 4263 persons in 1914. The cost of raw materials used was $10,528,000 in 1921, $28,157,000 in 1919 and $15,480,000 in 1914.

British Stocks of Used Tools Reduced

BECAUSE of its relatively low cost, secondhand machinery was the market attraction last year in Great Britain, according to a report on the British machine tool industry prepared recently by H. B. Allin-Smith, assistant trade commissioner, department of commerce, London. Continuing, Mr. Allin-Smith's report in part is as follows:

Sales of secondhand machine tools curtailed the scope of new British output drastically, but they have helped to eliminate much surplus war stock. The result is a satisfactory reduction of government supplies, and also a considerable depletion of stocks held in home and foreign markets, so that any current spurt in buying consistent with improving business foreshadows a temporary pressure on productive facilities—a welcome situation after two years of distressing dullness.

It is evident that specialty engineering firms have survived 1922 with the least harm, for they have been able to claim an occasional order for new equipment. Buyers of industrial machinery have confined their purchases rigidly to those up-to-date types of manufacturing equipment which offered immediate economy of costs.

Some of the more alert of the makers, forced to exercise their ingenuity in keeping plant and staff from complete and costly idleness, have continued operations by engaging in related lines of production, by replacing their own obsolete shop layouts to give future efficientcy, or by redesigning their lines of product to incorporate recognized improvements, dictated by lessons of wartime output.

Along with disposals of secondhand wartime machinery, the replacing of parts was found to be a profitable activity in some instances. One com-

Table I

Machinery Trade of United Kingdom, 1922

1922	Imports Tonnage	Imports Value	Exports Tonnage	Exports Value
January	2,789	£522,396	39,762	£5,799,824
February	3,176	637,524	34,884	4,636,529
March	3,667	774,345	44,621	5,882,623
April	3,444	652,283	30,089	4,280,354
May	4,559	765,830	22,068	3,053,053
June	3,757	664,747	16,251	2,321,902
July	3,642	635,002	24,111	3,191,042
August	4,427	764,336	35,638	4,363,798
September	3,609	623,222	35,059	4,280,692
October	4,400	683,317	37,121	4,561,481
November	3,458	651,171	41,714	4,818,822
December	4,520	792,711	42,041	4,536,162
Total	45,648	£8,166,884	403,359	£51,725,682

Monthly averages	Imports Tonnage	Imports Value	Average import value per ton	Exports Tonnage	Exports Value	Average export value per ton
1922	3,804	£680,570	£178	33,613	£4,310,470	£128
1921	4,584	698,750	198	42,167	6,219,200	147
1920	7,482	1,662,810	222	38,471	5,286,030	137
1913	8,632	605,550	70	57,449	2,800,200	48

pany, observing demands for 20 to 30-foot lathes, while secondhand short-bed tools were still available, repurchased munition lathes and converted them into long-bed types at trifling cost by inserting a gap bed-piece. Surplus lathes obtainable at almost scrap prices, having quite usable fittings, headstocks, etc., made this deal profitable.

Such makeshifts as the foregoing have enabled a few firms to operate, if not profitably, at least with less loss than otherwise. For the British engineering trade as a whole, however, 1922 was an unsatisfactory year. Almost all branches have an increased capacity of perhaps twice as large as prewar days, while the demand in 1922 was only a fraction of that in 1914. Under the circumstances, British foreign trade in machinery is at a rather low ebb, small indeed when compared with today's production facilities. The accompanying tables give details of exports and imports.

Naturally, widespread unemployment has encompassed the British machine-tool trades over many months. The unsatisfactory position of the iron, steel and shipbuilding industries contributed to this handicap so that between 25 and 30 per cent (250,000 to 300,000) of the insured workers registered in engineering industries have been idle the whole year. Many others have been continually on short time. Early in the spring endeavors were made to adjust working conditions in these trades to a more economical basis for reviving orders. This move brought a lockout which lasted three full months, to the middle of June, and since then the roll of engineering unemployed has declined slowly as trade has seemed to mend.

One other outstanding feature of liquidation was a revision of engineering wages. After the settlement of the spring lockout the reduction of the 26 shillings 6 pence weekly war bonus was considered. Much union opposition was exerted at the conferences, but employers have won their point with a cut of 16 shillings 6 pence per week, with a view to eliminating the remaining 10 shillings at an early date.

The final quarter of 1922 gave a distinctly more lively tone to the British engineering industries both as to inquiries and orders, so that the new year outlook is woven round a hopeful expectation of trading possibilities "at least 50 per cent better than in 1922." An encouraging few of the many extensive development schemes planned since, and even before, the war are materializing at home and abroad.

Table II

Classes of Machinery Imported by United Kingdom During 1921 and 1922

Machinery and parts thereof	Quantities in tons 1922	Quantities in tons 1921	Value—Sterling 1922	Value—Sterling 1921
Agricultural	3,167	5,941	£249,352	£536,807
Boilers and boiler house plant	700	809	84,278	76,875
Electrical machinery	4,514	2,601	1,158,373	709,081
Metal-working machine tools	3,385	3,000	423,504	632,205
Prime movers, not electrical	4,722	2,603	564,064	436,684
Sewing machines	566	176	140,537	58,636
Sewing machine parts	632	640	361,830	236,792
Textile machinery	2,396	2,949	584,423	708,804
Typewriters, complete	778	694	590,315	564,385
Typewriter parts	53	42	53,972	46,579
Machines and machinery, all other sorts	24,745	35,417	3,956,236	6,754,989
Total of machinery	45,648	54,872	£8,166,884	£10,761,837

Table III

Classes of Machinery Exported by United Kingdom During 1921 and 1922

Machinery and parts thereof	Quantities in tons 1921	Quantities in tons 1922	Value in £ Sterling 1921	Value in £ Sterling 1922
Agricultural	5,315	8,120	£589,706	£713,009
Boiler and boiler house plant	56,535	57,236	4,654,252	3,637,150
Electrical:				
Motors	10,899	9,403	2,847,453	2,284,326
All other sorts	7,334	7,514	1,891,681	1,867,409
Metal-working machine tools	20,061	12,167	2,920,508	1,530,811
Prime movers, not electrical:				
Engines: Internal combustion*	14,560	15,055	2,014,064	1,673,037
Steam reciprocating	11,035	9,651	1,620,977	1,171,654
Steam turbine and other rotary	3,777	3,350	1,106,007	1,097,213
All other sorts	688	1,014	125,241	141,522
Sewing machines, complete	1,735	1,726	384,079	310,525
Sewing machines, parts	7,556	18,063	1,397,738	2,633,922
Textile machinery:				
For spinning, etc.	119,017	127,818	19,823,600	18,082,836
For weaving, etc.	29,593	22,133	3,627,697	2,582,435
All other	8,434	5,205	1,661,587	907,400
Typewriters, complete	24	3	47,093	24,020
Typewriter parts	20	37	33,538	48,782
Machines and machinery, all other sorts	209,710	104,864	29,861,905	12,819,631
Total of machinery	506,293	403,359	74,607,096	51,725,682
Chief Destinations of Leading Classes Exported				
Agricultural machinery:				
European countries	2,005	3,204	204,326	258,572
Australia	177	963	21,165	98,069
South Africa	961	839	93,218	58,369
Prime movers:				
British India	8,114	9,894	1,186,395	1,201,361
European countries	8,182	7,222	1,415,743	1,221,303
South American countries	1,615	1,990	217,291	221,815
Textile machinery:				
British East Indies	60,230	62,231	8,867,443	7,980,183
European countries	40,009	30,316	7,589,188	4,963,229
Japan	22,532	22,765	3,085,726	3,088,952
China	16,489	19,797	2,097,799	2,528,916

*Except for airplanes, motor cars and motorcycles.

Promoting Health in Industry

A Series of Related Articles Dealing with Important Problems as They Affect the Industrial Workers—Consideration Is Given to the Best Practice in Eliminating Hazards and Providing Protection

BY C.-E. A. WINSLOW

V—Fatigue and Its Factors

STUDIES of industrial fatigue which have been conducted during recent years have introduced a wholly new point of view with regard to the question of planning the hours of labor. According to the older view it was to the immediate interest of the employer to make the working day as long as possible, and to the interest of the employe to make it as short as possible. It is true that certain individual industrial establishments, in Germany, Belgium and England, have reported that shortening of the working week had been accompanied by an actual increase in production. It was only the experience of England during the war, however, which attracted general attention to this problem.

In the earlier days of the war all the earlier English restrictions on the length of the work day were abolished in the supposed interest of production and a working week of ninety hours was not infrequent in certain essential industries. The results, from the standpoint of production, were so unsatisfactory that a special commission on the health of munition workers was appointed and this commission soon reached the conclusion that too long a working period might actually decrease production by producing a condition of physiological fatigue which made efficient work impossible. These results have been amply confirmed by investigations of the United States Public Health Service in this country; and we now know that, in certain industries, the proper regulation of the length of the working day may be a very real factor in productive efficiency.

Fatigue Limits Production

It is obvious that in many industrial processes this problem of fatigue as a limiting factor in production does not exist. Where the speed of a manufacturing process depends almost wholly upon the action of machines, as in certain textile operations, a 9-hour day will produce 12½ per cent more than an 8-hour day, irrespective of any human element involved. Even in processes whose speed is determined by the human factor there are many which call for muscular or nervous effort of a kind not resulting in fatigue which measurably decreases production. On the other hand, it is a real step forward in the science of industrial management to recognize that in certain processes of certain industries the regulation of a working day may not only prove beneficial to the employer but may also directly increase productive efficiency.

It is not only the total working week which is important but also its subdivision into working shifts. In processes where the fatigue factor is involved, the hourly production begins in the morning at a subnormal level, rises rapidly as the worker "gets his hand in," then falls toward the noon hour as fatigue effects appear. After the noon hour it starts on a level materially higher than that at which it stopped in the morning, rises slightly again and then falls sharply in the late afternoon. Prof. F. S. Lee and the other investigators co-operating with the United States public health in the study of this problem have found that in certain industrial processes the introduction of a brief rest period in the middle of each shift may so materially reduce the falling off due to fatigue at the end of the unbroken shift as to cause a substantial net increase in production. In other industrial processes no such increase in production occurs and it is evident that the relation between working hours and production is a problem which must be studied in relation to each particular type of work and each particular group of workers.

The length of the working day, however, is only one of a number of factors which may influence fatigue and therefore production. Overheating of the workroom, as pointed out in an earlier article of this series, has a definite effect of this kind upon productive efficiency as was shown in a careful study of the tin plate industry in England. Posture is another factor of primary importance. The arrangement of workbenches at a convenient height and the design of seats, where work is performed in the sitting position, may make a substantial difference in production. It is impossible here to go into the details of the designing of factory seats but the Safety Institute of America will be glad to put anyone desiring further information in regard to this point in touch with published studies or with experts who have investigated it.

Muscular Strain Can Be Reduced

Among the conditions which particularly favor industrial fatigue are: 1. Muscular strain; 2. nervous strain due to concentrated attention; 3. excessive speed and 4. monotony. Muscular strain may often be materially reduced by a careful study of the motions involved. The injuries that develop from lifting "tote-boxes" for example often is due quite as much to the shape of the boxes and to the extended position of the arms in carrying them as to their intrinsic weight. The writer recalls an instance where repeated strains experienced in setting buckets into a tank below the floor level were eliminated by the simple device of placing a bar at the proper point for the left hand of the worker to secure a support.

Fatigue due to concentrated attention and high speed is the type of fatigue which may often be expected to yield to the influence of brief rest periods. Fatigue due to monotony can in some instances be controlled by a slight rearrangement of the process which will permit of a certain variation in activity. In processes which involve close visual attention, such as inspection work, a careful study of the problem of illumination will be likely to prove of significant value. Either a deficient illumination or an excess of glare may produce a material increase in the fatigue involved in any given process.

In a large industry it will be well to have a psychologist on the staff to de-

(Concluded on Page 596)

The author is health supervisor, Safety Institute of America; chairman, New York state commission on ventilation; curator of public health, American Museum of Natural History; and professor of public health, Yale university.
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Heating and Cooling Large Ingots

Experiments Are Conducted To Obtain Sufficient Data for Calculating Maximum Rate of Heating Ingots Without Injury—Reliable Figures Now Are Available on 24, 30 and 45-Inch Sizes

BY F. E. BASH

ABOUT three years ago, the writer presented a paper on the rate of heating and cooling of a 24-inch round ingot. The present paper deals with work done on larger ingots at the plant of the Allis Chalmers Mfg. Co., Milwaukee, Wis., in August, 1919. Sufficient data on ingots of all sizes were desired to enable one to calculate in advance the rate at which any ingot could be raised to a forging temperature without injury to the steel, determining also the temperature gradient between different sections of the ingot and the length of time necessary to heat to the center. This now has been experimentally determined for 24-inch and 45-inch ingots by the writer and for a 18-inch cube by E. F. Law. J. F. Harper also has made tests on heat treating temperatures on 30-inch ingots; which data are included in this paper.

No attempts made here to work out a formula for the heat penetration of steel, for too many factors are involved concerning which we have not sufficient information, as for instance, the specific heat of steel up to 2300 degrees Fahr. It is hoped that eventually a set of formulas will be developed so that one may calculate maximum allowable temperature differences within an ingot for any particular kind of steel and the rate of absorption of heat and temperature gradient within the ingot for a definite temperature head.

From a paper presented at the annual meeting of the American Institute of Mining and Metallurgical Engineers held in New York, Feb. 19-21. The author is research engineer, Leeds & Northrup Co., Philadelphia.

Location of Thermocouples

The ingot tested was 45 inches in diameter, having been forged into the shape shown in Fig. 1 from 54 inches diameter. Seven ¾-inch holes were drilled 30 inches deep into the end, as shown in Fig. 3. The holes were made 7½ inches deeper than the length of the radius of the ingot so as to lessen the effect of heat penetration from the end on the inserted thermocouples, the hot junctions of which were at the bottoms of the holes. Holes 1 and 7 were drilled about 1 inch under the surface of the ingot, 4 was in the center, and the others were equally spaced between the surface and the center. The length of the ingot in the furnace was 8 feet 6 inches. The composition of the ingot was as follows: Carbon, 0.26; manganese, 0.52; phosphorus, 0.040; sulphur, 0.039; silicon, 0.19; and nickel, 3.57 per cent. A test was made with differential thermocouples on a sample cut from the ingot to determine the critical points.

The furnace was oil-fired with regenerative chambers; the plan being as shown in Fig. 1. Peep holes were provided at convenient locations, also holes for insertions of the thermocouples into the ingot. Directly above the ingot and also in the back wall, 2 2-inch closed end porcelain tube was inserted as a protecting tube for a platinum rhodium thermocouple to determine the furnace gas temperatures. Two rods with 1/32-inch nichrome sheet targets were welded in such a position that temperature readings could be made on them through the peep holes with an optical pyrometer. These readings were used as a check on the gas temperatures. The arrangement of targets and points where optical pyrometer readings were taken is also shown in Fig. 1.

Thermocouples were prepared from ⅜-inch extra heavy, wrought iron pipe and No. 8 B. & S. gage pure nickel wire, welded inside the pipe and protected with porcelain insulators. The nickel-iron couple was used in place of the usual iron-constantan to be able to reach forging temperature. It gives a fairly straight calibration curve with approximately 30 millivolts at 2400 degrees Fahr. The thermocouple temperatures were recorded with potentimeter recorders and the surface of the ingot, target, and inner wall temperature were taken with an optical pyrometer.

The ingot was placed upon blocks while the furnace was cold and the thermocouples inserted and connected to the recorders. In addition to the

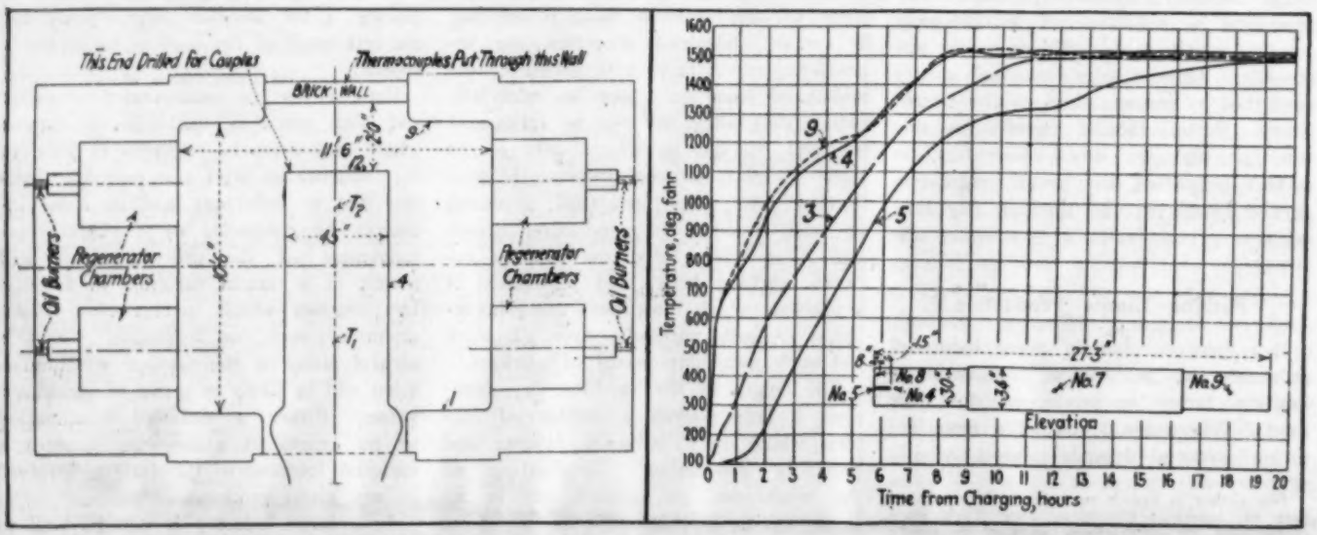


FIG. 1 (LEFT)—PLAN OF HEATING FURNACE USED IN CONDUCTING EXPERIMENTS. FIG. 2 (RIGHT)—HEATING CURVE OF 30-INCH INGOT SHOWING A SKETCH OF THE INGOT AND THE LOCATION OF THE THERMOCOUPLES

couples in the ingot, two were laid on top of it, one near each end. To be able to withdraw the couples from the ingot when it was up to heat and also to protect them, sleeves made from 1-inch pipe were slipped around them and up against the ingot, where they were luted in place with fireclay and digidly set in the brick wall of the furnace.

The furnace was started cold and the flames reversed every 20 minutes during the whole test. The schedule of heating was worked out and the heater was instructed to follow certain lines on the recorded paper. This he manager to do fairly successfully. He was able to hold an average gas temperature within approximately plus or minus 50 degrees Fahr. The log of the test is given in the accompanying table.

Little difficulty was experienced in running the test. A few of the thermocouples open circuited when the temperature got over 2000 degrees Fahr. but they were replaced. Approximately 17 hours was required to bring the ingot from room temperature to forging heat, at which time the center was at 2130 degrees Fahr. and the skin temperature was 2260 degrees Fahr. It was held at approximately the same temperature for a few hours, until the day crew came on, when the thermocouples were withdrawn and the ingot pulled from the furnace and laid to cool in the open air. As couples Nos. 1 and 7 had oxidized heavily and because of the settling of the support blocks, had been bent at the entrance to the ingot so that they could not be withdrawn, it was possible to get only the temperatures of points Nos. 4, 3, 2, and a contact point against the under side of the ingot, which gave outside skin temperatures that are somewhat lower than point No. 1 which was 1 inch under the skin would have been. At the end of 18 hours the temperature inside the ingot was between 600 and 700 degrees Fahr. and the outside skin temperature was 350 degrees Fahr.

Heating curves are shown in Fig. 3, also temperatures taken with the optical pyrometer which, it will be noted, check closely with the platinum thermocouple temperature curve *P* for the gas temperature. The gas temperature, after rising quickly to approximately 1200 degrees Fahr. at a point in the furnace directly above the ingot, was steadily increased at about the rate of 2 degrees per minute to 1800 degrees Fahr. in 5 hours, at which time the ingot started to pass through the critical range. The gas temperature was then increased at the rate of 1 degree per minute until shortly after the whole mass was completely through the critical range, after which the temperature was increased at the rate of 1.5 degrees per minute up to 2500 degrees Fahr., when it was dropped to 2350 degrees Fahr. and held there until the ingot was ready for forging.

Curve 8 shows the variations of the temperature of the end of a thermocouple lying on top of the ingot and directly above and on line with the couples in the ingot. It follows the gas temperature much more closely

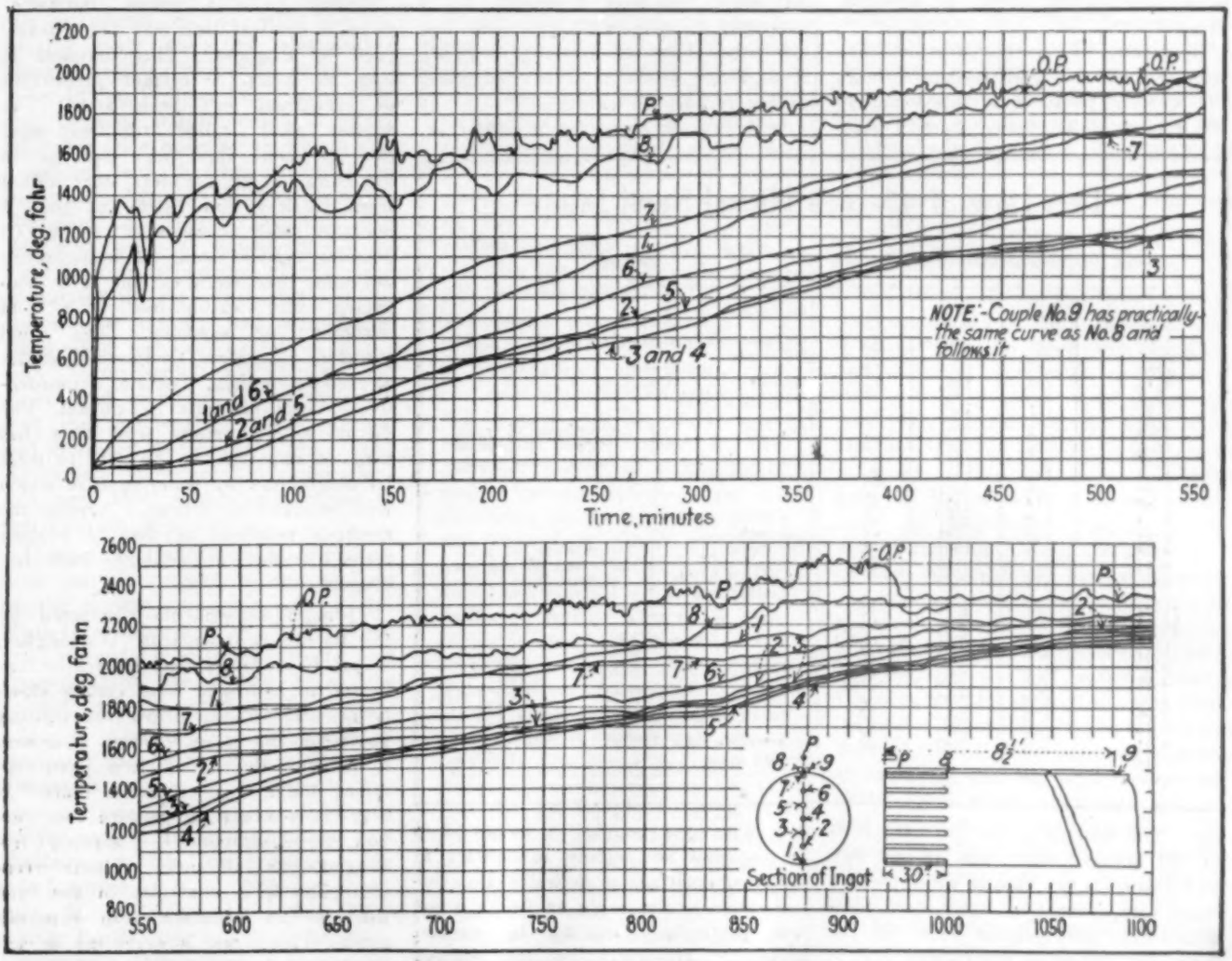


FIG. 3—HEATING CURVE OF A 45-INCH NICKEL STEEL INGOT. THE THERMOCOUPLES WERE LOCATED AS SHOWN BY THE SKETCH IN THE LOWER CURVE

than that of the ingot and apparently gives no indication of the critical point. Referring to the heating curves of the couples just under the skin the couple on top, No. 7, heated more rapidly at first although at the end the lower one, No. 1, became the hotter. These two couples give indications of passing through the critical range 5 hours before the center, Curve 4, was completely through. It is interesting to note also that the Ar_1 point on the small sample corresponded closely with the Ac_1 point of the large ingot, which occurs at 1200 degrees Fahr.

In cooling, the curves of which also were plotted, the final passage through the critical point was approximately 200 degrees Fahr. lower than in heating. The cooling in the air from 2200 to 660 degrees Fahr. was at the rate of 1.5 degrees per minute while the average rate of heating from room temperature to 2200 degrees Fahr. for the ingot was 2 degrees per minute.

Oil was burned at the rate of 38.92 gallons per hour, making a total for the 17 hours in which the ingot was coming up to heat, of 661.64 gallons and 91,512,840 B. t. u. at the approximate heating value of 18,500 B. t. u. per pound. The oil had a specific gravity of 26.0 degrees Be., 230 degrees Fahr. flash point, and 330 degrees Fahr. fire point.

Heating 30-Inch Ingot

In Fig. 2 are shown the heating curve and arrangement of couples for a 30-inch shaft which was brought up to 1500 degrees Fahr. in 230 hours in an oil-fired furnace at the plant of the Allis-Chalmers Mfg. Co., Milwaukee, by J. F. Harper. Curve 5 shows the rate of heat penetration to the center of the ingot, the thermocouple being inserted in a hole 15 inches deep. Curve 3 is for a couple 5 inches deep and curves 4 and 9 are for contact couples near each end, as shown. In the cooling curves for the same ingot cooled in the furnace, the passage through the critical range is well marked on both heating and cooling for couple No. 5 but is not so clear for couple No. 3. The probable reason is that the outside diameter of couple No. 3 was only ¾-inch, while the hole was 1½ inches diameter, and only 5 inches deep, which would allow the hot gases of the furnace to enter.

In a heating curve for a similar ingot with one couple 15 inches deep in the end and others in contact at different positions as indicated, the critical range is noticeable on Curve 5 but not particularly marked by contact couples. However, on the cooling curve for the same ingot the passage through the critical range is clearly shown. Apparently it depends upon how carefully the couple is held against the work as to the sharpness of the break in the curve. These curves give a good idea of the difference in temperature of the skin and the center of an ingot of this size and the length of time necessary to bring them all to a constant temperature.

In concluding the writer hopes that these data may serve as a basis for further experiments and calculations, which eventually will enable the steel man to determine exactly how fast he can heat any size ingot without injury. The information is known empirically for certain practices but should be worked out scientifically for all conditions and kinds of material. The writer wishes to thank J. F. Harper, H. Freeman, and the Allis-Chalmers Mfg. Co. for their kind assistance and co-operation and R. C. Drinker for his his interest and suggestions.

Test Low of 45-Inch Nickel Steel Ingot

Time	Minutes	Temperature degrees Fahr.	Position	Remarks
8:30 a. m.	0			Start
2:48 p. m.	378	1903	T_1	On target
2:49	379	1960	12	
2:51	381	1863	T_2	On iron rod—cut flame
4:08	458	2075	T_1	On target
4:09	459	1990	12	
4:10	460	1995	T_2	On rod
4:10	460	1965	9	On edge of arch
5:04	514	1975	T_1	
5:05	515	1903	1	On arch — Temperature of gas dropped 80 degrees during these readings.
5:06	516	2030	12	
5:07	517	1930		Floor under ingot — Temperature of gas dropped 80 degrees during these readings.
5:08	518	1970	T_1	On target—dark — Temperature of gas dropped 80 degrees during these readings.
5:08	518	1980	Pt.C	
6:47	617	2116	T_1	
6:48	618	2107	12	
6:49	619	2084	1	On arch — Temperature of gas dropped 30 degrees during these readings.
6:50	620	1965	4	On ingot — Temperature of gas dropped 30 degrees during these readings.
6:51	621	2160	T_2	
6:52	622	2148	P	Back wall beside Usalite tube — Temperature of gas dropped 30 degrees during these readings.
11:31	901	2378	T_1	
11:32	902	2477	1 arch	
11:33	903	2411	12 floor	
11:34	904	2463	Back wall	
3:27 a. m.	1137	2249	T_1	
3:28	1138	2249	1 arch	
3:29	1139	2233	4	
3:29	1139	2160	12	
3:30	1140	2205	T_2	
3:31		2193	P	On Usalite tube
9:40				Pulled ingot

Produces Rustless Iron in England

According to a recent announcement, a rustless iron has been developed in England. This material is iron to which a certain proportion of chromium has been added. A similar alloy called stainless steel has for some time been familiar to metallurgists but stainless steel differs from rustless iron chiefly in that it contains small amounts of carbon. To produce rustless iron, an iron-chromium alloy free from carbon, it is necessary that carbon-free iron and chromium be available. The usual forms of chromium, commercial grades of ferrochromium, contain comparatively large amounts of carbon. The discovery of rustless iron thus has made it important to be able to treat ferrochromium by some process which will remove the carbon. Among the methods proposed is that of heating ferrochromium in contact with hydrogen.

Through experiments conducted by the bureau of standards, Washington, it has been found that ferrochromium heated in hydrogen loses carbon slowly at temperatures below the melting point of the alloy. When hydrogen is bubbled through molten ferrochromium, the loss in carbon is rapid. It may be possible to prepare low carbon ferrochromium by blowing hydrogen gas through molten ferrochromium in a concerter of the type used in the manufacture of bessemer steel. This work is described in scientific paper No. 448 of the bureau of standards.

Promoting Health

(Concluded from Page 593)

vote himself to a special duty of the problem of fatigue. In a small plant the factory manager, if he keeps his eyes open and studies production records carefully, can contribute materially toward their solution. An important point is to remember that such problems exist and that the careful regulation of working conditions so as to promote the highest degree of physiological vigor is a real factor in industrial efficiency.

Ceramists Round Out 25 Years

Silver Jubilee Convention of the American Ceramic Society Held Last Week in Pittsburgh Was Largely Attended—General Addresses Delivered by Men of National Prominence—Membership Increases 20 Per Cent

REGISTRATION of nearly 600 members of the American Ceramic society, which held its twenty-fifth anniversary convention at the Fort Pitt and William Penn hotels, Pittsburgh, Feb. 12 to 16 far surpassed the attendance of any other meeting of the body since its organization. General sessions were held in the ball room of the William Penn hotel Monday morning and afternoon at which addresses were made by prominent men associated with the ceramic and other industries. Frank H. Riddle, Champion Porcelain Co., Detroit, presided. Mr. Riddle outlined the growth of the society since its foundation 25 years ago and stated the ceramic engineer in the last quarter century had been recognized as a technical expert on a par with the mechanical and electrical engineer and architect. He brought out that the membership of the society had increased 20 per cent during 1922. At present there are 216 corporations and over 1604 persons subscribing to the program of activities.

During the transaction of brief business an amendment to the by-laws of the society admitting college students to memberships at a reduced fee was adopted; reports by officers and committeemen, which had been preprinted, were accepted unanimously.

W. L. Clause, chairman board of directors, Pittsburgh Plate Glass Co., Pittsburgh, spoke on "Economic Aspects of Our Industries" outlining a plan for the present financial conditions and problems in the United States. He was followed by B. E. Salisbury, Syracuse, N. Y., whose topic was "Research: Its Relation to a Manufacturing Executive". He touched on the correlation of the scientific research employe and the executive and traced the history of the pottery and glass industries. Mr. Salisbury was followed by W. S. Primley who spoke on "Increasing Opportunities" and C. F. Binns on "The Art of Manufacturing and the Manufacture of Art".

Founder Receives Ovation

During the afternoon session Edward Orton, Jr., Orton Pyrometric Cone, Detroit; founder of the Ceramic society and of the first school of ceramics in the world, at Ohio State university, Columbus, O.; and, now practically retired from the active pottery and ceramic work was tendered a boisterous ovation when he appeared. His address entitled "The Value of Ceramic Engineering Education" was directed to all classes of engineers. He urged those of the profession to take a greater part in public affairs than now is being done by engineers in general and cited Herbert Hoover and Gifford Pinchot as examples of men with engineering education who have taken notable positions in public life.

Dean Cooley, University of Michigan, Ann Arbor, Mich., spoke upon the work that has been accomplished by the Federated American Engineering societies and cited this organization as a typical example of the valuable work engineers can do for the good of the public. He mentioned the achievements that had been or are being accomplished by the society which included investigation of industrial waste and work periods in continuous industries, the securing of patent legislation, advocacy of a department of public works in the federal government and the licensing of engineers by states.

English Metallurgist Speaks

Dr. Walter Rosenhain, in charge of the metallurgical department of the National Physical laboratory, Teddington, England, and rated as the foremost authority upon optical and chemical glass in the world, spoke upon the development of both industries in England stating that since the beginning of the world war it was necessary for England to engage in the manufacture of high grade glass.

Ways in which the bureau of mines can co-operate with and be of material assistance to the ceramic industries was discussed by Dr. H. Foster Bain, director, United States bureau of mines, Washington. He pointed out that these industries, in addition to the mining industries, must undergo reorganization to meet the problem of a lack of unskilled labor, which doubtlessly will result from a decline in immigration. The speaker declared the decrease in this direction appears to be inevitable for several years.

The first day of the silver jubilee convention closed with a banquet in the evening attended by over 400 members of the society. Officers for the coming years were installed and include A. F. Greaves-Walker, American Refractories Co., Pittsburgh, president; R. D. Landrum, Cleveland, vice president; Ross C. Purdy, Ohio State university, Columbus, O., secretary; R. K. Hursh, University of Illinois, Urbana, Ill., treasurer. Trustees elected were R. M. Howe, Mellon institute, Pittsburgh; B. E. Salisbury, Syracuse, N. Y.; F. H. Riddle, Champion Porcelain Co., Detroit; and R. R. Danielson, Washington.

Lawrence E. Barringer, General Electric Co., Schenectady, N. Y., acted

A Quarter Century of Progress

IN FEBRUARY 1898 a group of ceramists met in Pittsburgh to consider the advisability of organizing a society to promote the ceramic arts and sciences. A temporary organization was effected and, during the 12 months following, committees formulated plans that consummated in a permanent organization and the first meeting together in a convention for the reading and discussion of papers.

During these 25 years the society has published 19 volumes of Annual Translations and five volumes of a monthly Journal containing reports of observations, experiments, theories and results of industrial adoption of new materials, methods and equipment. The writings of Hermann A. Seger, the foundation of modern ceramic technology and science, were translated, and the world's first treatise on ceramic calculations was published. The literature produced and abstracted by the society during the past 25 years is the foundation on which the ceramic industries have developed iheir modern technology and science.

Not alone through publications has the society served the ceramic industries. Its larger and more effective service has been in the active and successful promotion of ceramic divisions in federal bureaus and geological surveys; collegiate training in ceramic engineering and science; industrial research in cooperation; and in standardization of methods, tests and materials.

as toastmaster at the banquet session while the speakers of the evening include Edward Orton, Jr., founder of the society; Frank H. Riddle, retiring president; Alexander Silverman, chairman of the Pittsburgh district section; Karl Langerback of the United States tariff commission, Washington, a pioneer in ceramic work; Walter Rosenhain, Teddington, England; and John G. Bowman, chancellor of the University of Pittsburgh.

Simultaneous Sessions Held

Technical sessions were held simultaneously the second and third days of the convention at the Fort Pitt hotel under the auspices of the industrial division. The sessions were divided into seven sections to dispose of the mass of papers, questions and symposiums. The sections included art, enamel, glass, heavy clay products, refractories, terra cotta and white wares.

Thursday and Friday were given over to plant visitations. The visiting members were divided into groups and four separate parties made trips on Thursday and three parties on the following day, this arrangement permitting each member to select two out of seven distinctive trips.

An exhibition of ceramics was held at the Fort Pitt hotel in conjunction with the convention of the society. Companies having refractory products on display during the week included the following:

Lavino Refractories Co., Philadelphia; American Refractories Co., Joliet, Ill.; Mitchell Clay Mfg. Co., St. Louis, Mo.; Carborundum Co., Keasbey, N. J.; Charles Engelhard ,Inc., New York; Crescent Refractories Co., Currensville, Pa.; Precision Grinding Wheel Co., Philadelphia; and Norton Co., Worcester, Mass.

Steel Founders Increase Scope of Activity

At a regular meeting of the Electric Steel Founders' Research Group held in Detroit, Feb. 5 and 6, is was decided to expand the scope of the organization's work and to provide for greater activity of the committee on new uses for steel castings. With this end in view W. J. Corbett, industrial engineer, was engaged to be associated with R. A. Bull, research director, in the increased activities of the group in its research work. Mr. Corbett's engineering training has been supplemented by several years of experience in plants of the American Steel Foundries, as well as the Watertown arsenal and the Erie Forge Co. Headquarters of Mr. Corbett will be 639 Diversey parkway, Chicago.

The Electric Steel Founders' Research Group is composed of the Electric Steel Co., Fort Pitt Steel Casting Co., Lebanon Steel Foundry, Michigan Steel Casting Co., and Sivyer Steel Casting Co. The more important investigations now being conducted by the group are said to be those on electric furnace practice, core practice and facing practice.

Committee Appointed in Locker Standardization

Washington, Feb. 20.—Manufacturers of steel lockers, meeting last Thursday with the division of simplified practice of the department of commerce to inaugurate a movement to eliminate unnecessary sizes, formed the following committee to lay the groundwork: C. S. Berger, Berger Mfg. Co., Canton, O., chairman; W. G. Brown, Durand Steel Locker Co., Chicago; M. S. Hart, Hart & Hutchinson Co., New Britain, Conn., and M. C. Miller, Fred Medart Mfg. Co., New York.

Following a lengthy discussion, the locker manufacturers adopted a resolution declaring their accord with the department's simplified-practice movement and proffering their cooperation. J. B. O'Connor, of the Lyon Metallic Mfg. Co., Aurora, Ill., stated he believed half of the 100 sizes his company manufactures could be eliminated. Mr. Miller believes six sizes—three widths and three depths—would answer all trade requirements.

The creation of a special association to carry out standardization was discussed but a committee was deemed preferable at this time.

News of Societies

Past and Coming Meetings of National and Local Trade and Technical Organizations

THE annual meeting of the Metal Trades Safety association was held at the King Edward hotel, Toronto, on Feb. 6. The organization was formed under the authority of the workmen's compensation act. The delegates present discussed the activities of the association during the year and laid plans for 1923. J. C. Callaghan, Hamilton, was elected chairman and H. H. Champ, W. H. Burgess, W. C. Twinbull and W. S. Campbell vice chairmen.

* * *

Discuss Defective Castings

"Defective Castings" formed the subject of discussion at a meeting of the New England Foundrymen's association at the Exchange Club, Boston, February 14. V. E. Hillman, metallurgist of Crompton & Knowles Loom Works, Worcester, Mass., presented the first paper and showed with lantern slides the development of modern blast furnace practice. Following Mr. Hillman, George C. McCormick, assistant metallurgist at Crompton & Knowles Loom Works, gave a practical talk on defective castings. He assumed, for the purpose of discussion, that cupola operation, chemical analysis of the molten metal, and other general features of the foundry were perfect, and then showed how defective castings might still develop through any one of a long list of reasons Chief of these was too wet molding sand. Nearly 150 members of the Association from all parts of New England were in attendance. The Bethlehem Steel Products Co. was voted in as a new member.

Convention Calendar

April 3-7—American Chemical society. Spring meeting New Haven, Conn. L. Parsons, P. O. Box 1515, Washington, is secretary.

April 18-20—Society of Industrial Engineers. Spring convention in Cincinnati. The headquarters of the society are at 327 S. La Salle street, Chicago.

April 19-21—American Gear Manufacturers' association, annual meeting, Hotel Cleveland, Cleveland. T. W. Owen, 2443 Prospect avenue, Cleveland, is secretary.

April 25-27—National Foreign Trade Council. Annual convention in New Orleans. O. K. Davis, 1 Hanover square, New York, is secretary.

April 28-May 3—American Foundrymen's association. Annual convention and exhibition at Public Hall, Cleveland. C. E. Hoyt, 140 South Dearborn street, Chicago, is secretary.

May 3-5—American Electrochemical society, semiannual meeting, Hotel Commodore, New York. Colin G. Fink, 327 South La Salle street, Chicago, is secretary.

May 7-9—American Association of Engineers. Annual convention at Norfolk, Va. C. E. Drayer, 63 E. Adams street, Chicago, is secretary.

May 17-19—National Supply and Machinery Dealers association; Southern Supply and Machinery Dealers association; and American Supply and Machinery Dealers association, triple convention, Cincinnati. F. D. Mitchell, 1819 Broadway, New York, is secretary.

June 25-26—American Society for Testing Materials, annual meeting at the Chalfonte-Haddon hall hotel, Atlantic City, N. J. C. L. Warwick, 1315 Spruce street, Philadelphia, is secretary.

Asia's Machinery Needs Growing

Equipment Markets in the Far East Are Developing Rapidly—Imports of American Machinery Show Huge Expansion in Past Few Years—Analysis of Individual Markets Shows the Growing Popularity of American Tools

BY W. H. RASTALL

NOTWITHSTANDING the fact Japan, the best of the Asiatic markets for American machinery ranks only fourth among the markets of the world, it should be emphasized that the Asiatic group shows signs of rapidly increasing importance and deserves more attention than the present volume of business might suggest. All five of the leading Asiatic markets rank better than 13 among American machinery markets. Of total machinery exports the Asiatic markets took 7.4 per cent in 1910, 6.8 per cent in 1913, 22.9 per cent in 1919, 18.5 per cent in 1920, and 26.1 per cent in 1921. In other words, the comparative importance of the Asiatic group, as expressed in percentages, expanded about three and one-half times in the last decade, and the value of American machinery absorbed by Asia rose from $3,800,000 in 1910 to $64,400,000 in 1921.

As contrasted with the markets of Europe which are contracting, the markets of Asia are showing most satisfactory expansion, and it would appear constructive sales effort would yield the best returns when applied to expanding markets. Most of the countries of Asia are densely populated and show indications of being capable of marked industrial development, as contrasted with markets in other parts of the world in territories that have developed more recently, where there is a lack of adequate population. South America, Australia, and other sections have their immigration problems, but with Asia it is more a matter of raising the standard of living and rapid progress is being made in this direction.

It is a mistake to think of Asia as the "unchanging East." Railways are being developed, shipping increases rapidly from year to year, mines are being opened, industries are being established, highways are being constructed, automobiles and trucks are being placed in service, and in a great many other ways the entire continent is showing signs of absorbing an ever-increasing volume of mechanical equipment of great variety. In mapping out a sales program for the current year the foreign-sales manager should make ample allowance for these and many other factors.

Japan ranked 4, 4, 8, 10 among the world markets for American machinery in 1921, 1919, 1913 and 1910, repectively. For many years Japan has surprised the world by its industrial development. There is something remarkably consistent about the way in which Japan has developed, and the increase in the volume of machinery absorbed, whether measured in dollars or in the relative importance of this market. Japan is being industrialized. The standard of living for its people has risen rapidly during the last several decades. Thirty years ago it was a cheap country in which to live; it has become one of the most expensive in the world.

Country On Gold Basis

The country is on a gold basis and the exchange situation has not become a problem. On July 30, 1914, the exchange value of the yen was $0.499; on July 31, 1920, it was $0.515; and on Dec. 1, 1922, it was $0.485. Probably the exchange will not get far from the par value, which is $0.4985.

American machinery rapidly is increasing in popularity in this market. In 1910 the United States supplied 20.1 per cent of the machinery absorbed by Japan. In 1919 the share of the United States had increased to 75.4 per cent, but conditions then were abnormal. In 1921 our participation was 52.9 per cent. These figures seem to indicate that more business awaits the American manufacturer in this market if he will take the steps necessary to secure it. Even with this lower participation in the trade, the total volume has been so large as to represent a very remarkable increase in the American share, which has expanded from about $1,700,000 in 1910 to nearly $21,000,000 in 1921.

China in 1921, 1919, 1913, 1910 ranked 5, 7, 28, 15, respectively, among our machinery markets the volume having increased from about $642,000 in 1910 to more than $18,000,000 in 1921. It would be difficult to find a better record for expansion in both volume and rank. Chinese exchange always fluctuates very rapidly and widely, as the currency is practically on a silver basis and follows the silver-bullion market. The Shanghai tael on July 30, 1914, was worth $0.60; on July 31, 1920, it was worth $1.065; and on Dec. 1, 1922, $0.713. In the face of disturbed political conditions, unsatisfactory currency systems, inadequate transportation, and a number of other disturbing factors, trade in China expands rapidly in many directions and industrial activity shows rapid development. Moreover, American equipment is becoming increasingly popular in China. Our share of the total machinery trade of that country was 5.8 per cent in 1911, 8.3 per cent in 1914, 30.4 per cent in 1918, and 54.1 per cent in 1920.

British India ranked 8, 15, 22, 19 among our machinery markets in 1921, 1919, 1913 and 1910, the volume of American machinery absorbed having increased from $500,000 in 1910 to $10,700,000 in 1921. Exchange in India has been fluctuating widely. On July 30, 1914, the value of the rupee was about 32 cents; on July 31, 1920, it was 37.25 cents; and on Dec. 1, 1922, it was 30.03 cents. The currency fast is approaching stability.

The industrialization of India has become the avowed policy of both the government and the public. The imports of machinery are expanding rapidly, and during recent years the American participation in this trade has shown a marked increase. During the fiscal year 1913-14 the total imports of machinery into India were valued at £6,000,000, of which the United States furnished 1.8 per cent. During the war imports fell off, but American participation increased rapidly. During the year 1919-20, when the forces of reconstruction had begun to operate, the imports were £8,600,000, of which the American share was 29.3 per cent. During the year 1920-21 the machinery imports were £25,300,000, and although the volume from the United States increased, the percentage fell to 13.7 per cent.

India may be expected to show rapid development along all industrial lines that its population and resources can support. In spite of the fact that there is a large volume of native capital available, it should be noted

The author is chief of the industrial machinery division of the United States department of commerce, bureau of foreign and domestic commerce.

that British capital is flowing into the country at an ever-increasing rate, and the markets of India may be expected to absorb increasing volumes of industrial machinery from now on. Unfortunately the machinery users of India have a very inadequate knowledge of the types of machinery produced in the United States and the uses to which they may be put. India is a large market that deserves careful sales work of a character suited to its development.

Among the markets for American machinery the Philippines ranked 11, 8, 11, 18, respectively, in 1921, 1919, 1913, and 1910, and the value of American machinery absorbed increased from $500,000 in 1910 to $5,500,000 in 1921. This represented most of the machinery taken by the archipelago, the American share of the total having expanded from 73.1 per cent in 1915 to 97.3 per cent in 1920. In fact, American influence in this territory is so strong as to make it almost part of the domestic field.

The exchange situation is independent of that of Europe. On July 30, 1914, the Philippine peso was worth 49.9 cents; on July 31, 1920, 47.25 cents; and on Dec. 1, 1922, 48.2 cents. Currency has reached reasonable stability.

The sales manager's problem in this territory is one of development, which has been rapid since American occupation. In this market one will find endless problems, not the least of which is the comparative scarcity of labor. But, on the other hand, the sugar industry has been expanding rapidly and in the years to come will probably show further development. In many other directions this market shows great possibilities.

In 1921, 1919, 1913, and 1910, respectively, the Netherlands East Indies ranked 13, 17, 25, 27 among our machinery markets, value of American machinery exports expanding from $84,000 in 1910 to $5,000,000 in 1921. This has been due largely to the fact American machinery has become better known in the country since the beginning of the European war. Circumstances connected with the war served to introduce our equipment there, and since then American machinery has been popular. Satisfactory development of this market, however, depends upon careful sales work.

Excluding machinery for sugar factories, America's share in this trade was less than 2 per cent up to 1914. At that time, however, important progress began and by 1919 (the last year for which data are available), American participation was 34.5 per cent. Of the machinery for sugar factories the United States supplied less than 1 per cent up to 1915, but its share increased to 36.8 per cent by 1918, after which it fell off rapidly to 4.1 per cent in 1920.

This market offers a difficult sales problem, but inasmuch as it absorbs more than $5,000,000 worth of our machinery a year, and as conditions indicate a larger participation might be developed, it would appear the trade deserves the necessary attention. Conditions in this market are obviously related to those in the Netherlands, and the two territories should be considered jointly. Exchange is on a reasonably satisfactory basis. On July 30, 1914, the guilder was worth 40.9 cents; on July 31, 1920, it was worth 34.4 cents; and on Dec. 1, 1922, it was worth 39.6 cents.

Business in this market has been confronted with serious problems during recent years. Sugar is one of the most important products, and the reaction of the sugar market has been felt seriously, but as the price of this commodity now approximates 4 cents, it would appear the industry is again on a profitable basis. The fluctuations in the rubber market have also seriously affected this archipelago, but in this respect, also conditions have improved greatly. Java is one of the garden spots of the world, and it would appear that reconstruction has now advanced to such a point that important development may be expected as rapidly on the present favorable business conditions enable these interests to overcome the difficulties resulting from the recent experiences.

Conditions in the smaller Asiatic markets, such as the Federated Malay States, Ceylon, Siam, and Indo-China, are to a greater or less extent reflected by those indicated above, and it will be noted that the conditions in the entire territory encourage the expectation of important developments in the near future. No general rule can be laid down that will apply to the marketing of all kinds of machinery, and obviously it would be folly to expect these markets to employ the more specialized types that have been developed for use in the United States. On the other hand, there is a definite opportunity to expand the sales of those other types that are suitable for use in these countries.

The machinery markets of Asia are so important and the extension of American participation there during recent years has been so great that a special report on this subject has been prepared by this bureau and will be ready for distribution in the near future. The subject has been treated rather exhaustively, the report totaling 332 pages, well supplied with illustrations, charts, diagrams, and several maps that have been specially prepared to indicate the size and importance of these markets. The volume of the trade of each country, the kinds of machinery absorbed, the nature of industrial development needed, and the methods by which the business should be secured and handled have been treated with very great care. This report is entitled "Asiatic Markets for Industrial Machinery" and can be secured from the superintendent of documents, government printing office, Washington.

Ford Plan in Glass Plant

Pittsburgh, Feb. 20.—The Ford investment plan, including an 80 per cent increase in wages for labor and graded increases for skilled workers yesterday was instituted at the Allegheny Plate Glass Co., Glassmere, Pa., recently purchased by Henry Ford, under supervision of William E. Carnegie, personal representative of the Ford interests, according to announcement last night by D. K. Albright, general manager of the plant. Mr. Albright said the hiring rate for common laborers is 62½ cents an hour, which rate is to be increased to 75 cents an hour after 60 days' probation. Persons under 20 will not be employed at the plant. The plant employs about 525 men.

Resumes Barge Shipments

Pittsburgh, Feb. 20.—The Jones & Laughlin Steel Corp. will make its first shipment of the season of manufactured steel products to Memphis, Tenn., March 15. The steamer WARREN ELSEY of the Vesta Coal Co. has been selected to tow 10 steel barges with a total of 8500 tons. It is expected that this shipment will start that interest's regular monthly tows inaugurated last year to serve its customers in the South and West.

Promotion Encouraged

No position of responsibility will be filled at the Bloomfield, N. J., works of the General Electric Co. hereafter, it is announced, until a thorough canvass has been made to see if an employe of the plant can fill the position. In order to qualify for higher positions employes can register with the examining board which has been organized at the works to assist employes in advancement from the ranks.

Threatens To Cut Alien Quotas

House Committee Reports Out 2 Per Cent Restriction Bill, Reducing Number of Admissible Immigrants Nearly One Half—Claims There Is Surplus of Labor—Tactical Maneuver Against Allowance of Increase

WASHINGTON, Feb. 20.—In reporting out favorably its 2 per cent immigration restriction bill the house immigration committee not only rejects every claim of industry that it is being retarded by an actual shortage of labor but also sets up the counter-laim that fully 1,500,000 workmen are involuntarily unemployed at this time, to say nothing of the 250,000 surplus miners in the coal industry.

For the present the committee's new bill is no more than a threat to industry. It has been reported out as a substitute to the senate's bill admitting 25,000 Aremenian refugee orphans. Chairman Johnson the house comittee intends pressing for a vote before March 4, and it is possible that the house may approve it. Members of the committee expect no action in the senate, and look for the present 3 per cent act to run its full course to June 30, 1924.

The bill represents the house commitee's attitude toward immigration and sums up what industry and other pro-immigration forces must battle at the session of congress convening next December. In urging a reduction in immigration at this time the house committee is sending up a trial balloon. By setting up a shortage of labor the house committee puts itself in position to claim it will be doing industry a benefit if it should concede continuation of the present 3 per cent act. The committee is attempting to intrench itself for the struggle in the next congress.

The 2 per cent bill of the house committee effectually shuts off the line that has been filling the steel industry's reservoir of common labor. The 3 per cent act now in force predicated upon the number of aliens in the United States in 1910. Elminating the exempt classes, such as students and professionals, the present act admits 357,803 persons annually. The 2 per cent bill, based upon the 1890 census, would let in only 186,437 persons. It is true that the proposed bill would admit more relatives in direct family lines than can now come in under the 3 per cent act and in this respect would be more humanitarian, but so far as common labor is concerned the bars are put down much tighter.

It was not until after 1890 that the southern European countries, upon which the iron and steel industry has become greatly dependent for its common labor, began sending their nationals to the United States. The 3 per cent act permits 5638 Hungarians to come to the United States annually; the proposed 2 per cent act would admit only 874. Liwewise, the inflow of Austrians would be reduced from 7451 to 1503, and of Italians from 42,057 to 4312. The effect of the proposed measure would be to increase proportionately the arrivals from northern and western countries that are not now supplying the steel industry any appreciable amount of common labor.

In its favorable report on the 2 per cent bill the house immigration committee states:

"Employers of labor in the United States have undertaken to show to the committee that there is a shortage of common labor; that aliens must be had to do the rough work, the trench digging, the excavations, the road building, the repairing of railroad beds, the handling of heavy raw materials, etc., and, while the committee agrees that there has been recently an absence of unemployment—quite striking in comparison with the fact that 5,000,000 or more wage earners were out of work in the United States only 12 or 14 months ago—the committee is of the opinion that the alleged labor shortage and the effects of immigration curtailments are being misunderstood and over-rated.

"The house committee had before it many witnesses on the labor phase of the immigration problem and received letters, telegrams, statements and arguments from many others. Those who advocated the admission of laborers were unable to solve the problem of quantity or the problem of when to admit these laborers' wives and dependents. This is the very problem that has led to the inclusion of the relatives provision in the house measure. The committee was unable to concur in the arguments of James A. Emery, representing the National Association of Manufacturers, that laborers in bulk might be brought here from certain countries, to be placed at certain points, and to be sent back at a definite time. The recommendation of the association that the United States 'assert the right to register, distribute, educate and otherwise supervise the alien during his period of alienage' cannot be sustained for the reason that 'distribution' and 'supervision' might develop a system of peonage abhorrent to the institutions of the United States.

"The prosperity of the United States does not depend upon additional unskilled immigrants coming to this country. There are 1,500,000 unemployed now here. Quotas from northwestern Europe are not exhausted. There are 250,000 coal miners who are unemployed regularly due to overabundance of workers in that occupation. Aliens who leave this country temporarily may return within six months outside of quotas. If work was so plentiful why did more male immigrants go back to their native lands than came here in the year ended June 30, 1922? During the six months ended Dec. 31, 1922, immigants exceeded emigrants by approximately 220,000, with a great increase from northwestern Europe. The natural resources of the United States—coal, oil, gas, iron and other minerals, timber, etc.—are not inexhaustible."

Even under the restrictive 3 per cent act the net gain in aliens in the United States has been increasing. In the last six months of 1921 the number of immigrants was 200,121, and of emigrants 137,878, making the

Proposed Reduction in Quotas

To Each Quota on 1890 Basis Must Be Added a Basic Allotment of 400, or 17,600 for All Countries

	Present quota 3 per cent 1910	Proposed 2 per cent 1890
Albania	288	4
Armenia	230	13
Austria	7,451	1,103
Belgium	1,563	510
Bulgaria	302	61
Czechoslovakia	14,557	2,031
Danzig	301	228
Denmark	5,619	2,785
Finland	3,921	472
Fiume	71	11
France	5,729	3,914
Germany	67,607	51,227
Greece	3,294	47
Hungary	5,638	474
Iceland	75	37
Italy	42,057	3,912
Luxemburg	92	58
Memel	150	114
Netherlands	3,607	1,637
Norway	12,202	6,454
Poland	21,076	5,156
Eastern Galicia	5,786	870
Pinsk	4,284	395
Portugal	2,465	474
Rumania	7,419	638
Bessarabian region	2,792	250
Russia	21,613	1,992
Esthonian region	1,348	124
Latvian region	1,540	142
Lithuanian region	2,310	313
Spain	912	91
Sweden	20,042	9,561
Switzerland	3,752	2,082
United Kingdom	77,342	62,458
Yugoslavia	6,426	851
Other Europe	86	5
Palestine	57	1
Syria	928	13
Turkey	2,388	129
Other Asia	81	45
Africa	122	44
Atlantic Islands	121	41
Australia	279	120
New Zealand and Pacific Islands	80	42
Total	357,803	168,837

net gain 62,243. In the last six months of 1922 immigrants numbered 271,732 and emigrants 55,139, the net gain being 216,593. The 271,732 immigrants arriving in the last half of 1922 were split up into 147,378 males and 124,354 females, and the 55,139 departing aliens into 37,255 males and 17,884 females. In the last half of 1922 iron and steel workers arriving totaled 1116 and those departing 47. Two hundred and twenty-eight metal workers other than iron and steel arrived and five departed. Incoming machinists numbered 1490 and outgoing ones 236.

Three of the 15 members of the house committee have submitted a minority report, alleging discrimination against the countries of newer immigration. These three ask: "If it was not intended arbitrarily to discriminate against the immigration from Austria, Czechoslovakia, Denmark, Italy, Norway, Poland, Rumania and Sweden why did the proponents of the measure take the 1890 census?" This minority report covers little weight because it is based upon sentiment and not upon industrial needs, although it does refer to the probable exclusion of 60,000 to 75,000 needed laborers annually.

Much capital is made by the committee of the fact that in addition to the quotas of 2 per cent of the number of aliens in the United States in 1890 the bill allots every country a basic quota of 400. Since 44 countries figure in the quotas, it is claimed that industry is given a stake of 17,600 at the outset. But even including this 17,600, the 2 per cent act would reduce the number of permissibles from 357,803 to 186,437—almost half. There is no chance of the 3 per cent act being amended at this session, but the congress convening December must provide for the period beginning June, 30, 1924.

Germans Work Overtime in Unoccupied Mines

Berlin, Feb. 8.—According to the terms of a recent agreement between the labor unions and the ministry of mines, German coal miners have agreed to work overtime again to the extent of an hour a day. The ministry of mines has announced that such overtime is now compulsory. In view of the strikes which the government is engineering in the Ruhr this decision appears rather inconsistent, but the purpose is to increase the brown coal production in south Germany outside the occupied area.

Insofar as Ruhr coal is concerned, the ministry of mines has agreed to a special addition of 12 per cent on the price of such coal as the French permit to leave the occupied zone for the interior of Germany. It is said this increase is for the purpose of compensating the mine-owners for forcible deliveries to France inasmuch as the German government refuses to undertake any financial responsibility towards such deliveries.

The wages of the Ruhr miners are rapidly advancing. They were 700 marks per shift on Jan. 1 and are now 1000 marks and it is expected that before long they will be 2000 marks per day. The ministry of mines announces that there have been no disturbances either in work or traffic conditions in Silesia and there is a slight improvement in coal production in this part of Germany.

During 1922 Germany imported 3,724,321 tons of British coal and coke as compared with 664,749 tons in 1921. The heaviest shipments were in August, September and October. Recently buying has been renewed in British markets and during the latter part of January orders were placed in the Hull, Newcastle and Wales districts for at least 250,000 tons for shipment during the next three months.

Sheet Output Increased in Youngstown District

Youngstown, Feb. 20.—Increased sheet production marks the only material change in the district mills this week. Republic Iron & Steel Co. has put on eight more mills than last week, bringing its sheet production to capacity. Iron and steel production remains unchanged since last week.

The Hannah furnace of the Republic company, idle since 1920, will be blown in about the first of March, and the Tod stack of the Brier Hill Steel Co. will be in at nearly the same time. Thirty-five of 46 blast furnaces in the district will be in operation when the Hannah is blown in.

Mechanical trouble forced the stopping of five of nine sheet mills of the Sharon Steel Hoop Co. this week and they will be down until March 5.

Fabricators continue to report exceptional operations for this period of the year.

Percival Wilds has been appointed receiver for the Brooks-Ostruk Co., Inc., manufacturers of automobile bodies, New York, under $20,000 bond. Liabilities are stated at $39,000 and assets $73,500.

Foreign Demand

Slumps on Sulphate of Ammonia Light Oil Distillate Buying Continues

New York, Feb. 20.—As foreign demand has slumped off considerably within the past few days, the bulk of present trading in sulphate of ammonia is comprised of small lots for domestic consumption. Producers, however, are in a good position, for while production is heavy, they are well sold ahead, with sufficient back orders to absorb any particular surplus. Prices are steady at $3.15 to $3.20 f. o. b. works, for domestic business and $3.55 to $3.60, port, in double bags, for export.

Buying of light oil distillates is holding up well, there being a fairly active demand for practically all descriptions. Prices, reflecting this steadiness, are unchanged at 30 cents in tanks and 35 cents in drums, for pure benzol, 27 cents in tanks and 33 cents in drums for 90 per cent benzol; 30 cents in tanks and 35 cents in drums for toluol; 27 cents in tanks and 32 cents in drums for solvent naphtha; 26 cents in tanks and 34 cents in drums, for commercial xylol, and 30 cents in tanks and 35 cents in drums, for pure benzol.

The market on ball and flake naphthalene is strong, with some of the leading prdoucers virtually out of the market for over the next 50 to 60 days. Current sales are involving only relatively small quantities. Phenol continues strong at around 24 cents, producers' plants.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.30
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producres' Plants

Phenol	$0.24
Naphthalene flake	nominal
Napthalene balls	nominal

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.15 to $3.20

Contract

Pure benzol	$0.30
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.24
Naphthalene, flake	nominal
Napthalene balls	nominal

David S. Polier has been appointed receiver of the New York Art Metal Works. The liabilities are about $7000 and assets about $2000.

Silica Brick

Prices Becoming Firm—Fair Orders For Chrome Brick Placed

Pittsburgh, Feb. 20.—Orders for silica brick placed recently are larger in the aggregate than those for fire clay in the experience of not a few producers. Several note a tendency on the part of consumers to anticipate needs, and orders for requirements over the remainder of the quarter are made purposely large in the hope that they will be carried over into the second quarter at present market prices. Makers are not inclined to accept knowingly business for shipment that far ahead at present levels. Silica brick prices are becoming somewhat stronger and while lower than $42 recently has been done, nothing below that has been recognized as the official market price by the majority of producers in this locality. In Chicago $47 continues to be quoted while at Birmingham $48 is understood to be minimum.

Refractories

FIRE CLAY BRICK
(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$43.00 to 46.00
Pennsylvania, No. 2	38.00 to 41.00
Ohio, No. 1	40.00 to 42.00
Ohio, No. 2	36.00 to 38.00
Illinois, No. 1	43.00 to 46.00
Illinois, No. 2	40.00 to 42.00
Kentucky, No. 1	40.00 to 42.00
Kentucky, No. 2	36.00 to 38.00
Missouri, No. 1	38.00 to 40.00
Missouri, high grade	48.00 to 50.00
Maryland, No. 1	45.00 to 48.00
Maryland, No. 2	35.00 to 42.00

SILICA BRICK

Pennsylvania	$42.00
Chicago	47.00
Birmingham	48.00

MAGNESITE BRICK
(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$50.00

Activity in connection with fire clay likewise is fairly heavy and while no definite lots for new construction purposes have been closed, specifications on contracts continue to be filed regularly. Large quantities of brick for new construction in connection with open hearth furnaces at the Duquesne works of the Carnegie Steel Co. as well as in connection with the South Side plant improvements of the Jones & Laughlin Steel Corp., will reach the ordering stage some time within the next few weeks.

A fair number of orders involving from 5000 to 50,000 chrome brick each have been closed recently, all carrying the $50 price. Two Ohio steel companies recently have placed orders for 25,000 and 50,000 brick, respectively. Most others are under contract and are furnishing specifications regularly, having protected themselves for some time to come several weeks ago. A fairly large number of magnesite brick users likewise are under contract for their requirements although spot needs occasionally have to be met and this explains the presence of numerous carload orders in the market involving 10,000 or 15,000 brick at a time. On these orders, $65 seaboard base, remains firm and some makers look for an early advance due to the fact that, subtracting the tariff, a figure is left which is only about $1 above the price prevailing several months ago before the levying of the tariff, and producing costs have advanced more than $1 per ton in the interval.

Cleveland Cliffs Offers Trust Bond Issue

The Cleveland Cliffs Co., has notified stockholders of an opportunity to subscribe to $1,400,000 serial 6 per cent collateral trust bonds at par and accrued interest. Subscription rights expire on March 15, 1923. In his letter to stockholders President William G. Mather states that the company offered an issue of $3,500,000 collateral trust bonds in 1915. Of that amount all but the sum now being offered have been retired or have expired unissued. Owing to the dullness of the steel trade last year the company's inventories have increased, according to President Mather, and the bonds are being offered to reduce current liabilities. Following is a condensed balance sheet of the company as of Nov. 30, 1922 and Dec. 31, 1921:

ASSETS

	Nov. 30, 1922	Dec. 31, 1921
Property, investments	$44,522,634	$47,104,770
Current, other assets	23,953,846	20,214,577
Totals	$68,476,481	$67,319,347

LIABILITIES

Capital	$9,957,400	$9,957,400
Current, other	9,305,522	7,666,919
Capital surplus	19,036,195	19,703,011
Profit and loss surplus	30,177,363	29,992,016
Totals	$68,476,481	$67,319,347

American Can Net Gains

Net earnings of the American Can Co. were more than doubled in 1922, according to the annual report for the year. The net for the year ended Dec. 31 amounted to $14,898,924, contrasted with $7,020,261. F. S. Wheeler, new chairman of the company, succeeding Daniel G. Reid, resigned, said that the prospects for 1923 were favorable. He pointed out, however, that labor, fuel and transportation costs are high and that farm products were still low compared with other commodities. Consumption of the company's products in 1922 was the largest on record save in 1918.

Baldwin Locomotive Works Earnings Drop

Earnings of the Baldwin Locomotive Works declined last year to $1,994,361. They were $8,112,694 in 1921. Gross sales of $33,087,258 were reported compared with $49,945,506 in the preceding year. The company received considerable revenue from dividends distributed by the Standard Steel Works, which it controls. The detailed income account follows:

	1922	1921
Gross sales	$33,087,258	$49,945,506
Cost of sales	31,092,897	41,832,812
Operating income	$1,994,361	$8,112,694
Other income	6,078,574	2,512,763
Total income	$8,072,935	$10,625,457
Other expenses	1,307,421	.....
Gross profit	$6,765,514	$10,625,457
Reserves, etc.	1,558,995	5,581,361
Net cash profit	$5,206,519	$5,044,096
Preferred dividends	1,400,000	1,400,000
Common dividends	1,400,000	1,400,000
Surplus	$2,406,519	$2,244,096

The balance sheet at the close of 1922 showed net current assets of $51,154,050 against net current liabilities of $12,964,818. The figures at the close of 1921 were $48,423,233 and $14,379,061 respectively. The chief items among current liabilities included: Accounts payable $6,370,582, bills payable of $5,000,000 and depositors' saving fund, $1,594,235. The profit and loss surplus at the end of the year totaled $18,930,777.

Sees Farmer Buying

Higher prices for farm products has enabled the farmer to re-enter the market for farm implements, according to a statement in the annual report of President William Butterworth of Deere & Co., Moline, Ill.

Deere & Co. for the year ended Oct. 31, 1922, reports a deficit of $2,520,779 after charges, taxes and depreciation, compared with a deficit of $2,752,801 in 1921. The payment of $1,312,500 in preferred dividends increased the year's deficit to $3,833,279. At the close of the fiscal year the profit and loss surplus was $8,201,407, against $12,034,686 a year previous.

On Oct. 31 last the company's current assets were $37,922,233, against current liabilities of $4,209,322, leaving net working capital of over $33,000,000. Cash on hand amounted to approximately $4,075,000 and receivables were $14,850,000. Current liabilities included $2,279,000 in accrued taxes.

A voluntary petition in bankruptcy has been filed by the Wisconsin Iron Co. of Rice Lake, Wis., which admits liabilities of $47,693 and has assets of $2873.

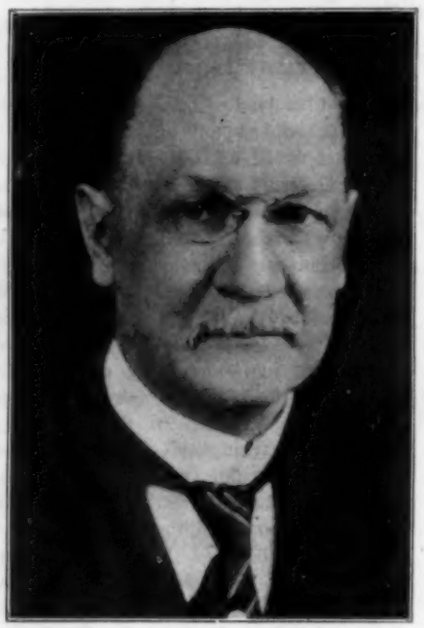
Obituaries

WILLIAM PENN WORTH, president of the Worth Steel Co., Claymont, Del., and one of the best-known figures in the eastern steel industry died Feb. 14 in his apartment at the St. James hotel, Philadelphia. Death was due to heart disease, from which he had suffered during the past six months. Mr. Worth was born June 23, 1856 at Coatesville, Pa., and graduated from Swarthmore college in 1876. In 1881 he and his brother, the late John Sharpless Worth, built and operated rolling mills at Coatesville, conducting the business under the firm name of Worth Bros. until 1895 when they incorporated as the Worth Bros. Co. Under the efficient management of Mr. Worth and his brother, the property developed into one of the largest steel interests in the East. In 1915 the property, together with a plant at Coatesville known as the Coatesville Rolling Mill Co., which the two brothers had purchased in 1886 and which formerly had been owned by their father, the late S. B. Worth, was sold to the Midvale Steel & Ordnance Co. Although identified with many other interests, Mr. Worth shortly after decided to get back in the steel business and in 1916 he acquired 600 acres at Claymont, Del., having a frontage of one-half mile on the Delaware river. Under the name of the Worth Steel Co. he and his brother built a plant for the manufacture of plates and of this company Mr. Worth was president until his death. Mr. Worth always was a dominant factor in the enterprises with which he was connected and he was widely known in the commercial end of the steel trade.

Harry L. Williams, for more than 30 years manager of the American Foundry & Furnace Co., Milwaukee, was found dead in bed at the home of his sister in York, Pa., recently. He was 68 years old.

Daniel W. Tower, who established the first brass foundry in Grand Rapids, Mich., in 1882, which was the nucleus of the Grand Rapids Brass Co., died Feb. 15 at his home. He was 75 years old and was nationally known as a traveler and lecturer.

Howard M. Wilson, aged 60, president and director of the Taylor-Wilson Mfg. Co., McKees Rocks, Pa., builder of tube and rolling mill machinery, died suddenly in his office Friday, Feb. 16. Mr. Wilson was one of the founders of the Taylor-Wilson company, which was organized in 1893, and for the last 10 years had been president. He was born in Pittsburgh and was one of the founders and charter members of the Pittsburgh Foundrymen's association,



WILLIAM PENN WORTH

was a member of the Pittsburgh chamber of commerce and various other organizations.

Wade A. Taylor, chairman of the board of the American Zinc Products Co., Greencastle, Ind., died Feb. 17, in his apartment in the Huntington hotel, Pasadena, Cal., of heart disease. He was 53 years old having been born at Londonville, O., March 26, 1869. He had been actively identified with the organization and executive administration of various industrial concerns, including the Empire Iron & Steel Co., Niles, O., which with Charles S. Thomas he organized in 1902 and was president of the Deforest Sheet & Tin Plate Co., Niles, until it was acquired by the Republic Iron & Steel Co. At one time Mr. Taylor also was head of the Valley Iron Co., Youngstown, O., iron and steel brokerage firm. In addition to his industrial activities he was also prominent as a banker, being president of the Dollar Savings bank of Niles. He graduated from Wooster university in 1890. Upon leaving school he went to work in the First National bank at Niles as a clerk, of which he later became president. Mr. Taylor's home was in Youngstown, O. He had been visiting in California with his family during the winter months, and his death came as a surprise as he had not been ill and was not known to be suffering with heart disease.

D. A. Decrow, manager of the water works department of the Worthington Pump & Machinery Corp., died at his home in East Orange, N. J., Feb. 15.

Philip Murray Reynolds, treasurer of Scott & Williams, Inc., New York and Lakeport, N. H., builder of knitting machines, died in a Boston hospital, Feb. 16. He was 55 years old.

Harvey Smith McLeod, fire brick manufacturer, died Feb. 16 at his home in Troy, N. Y. Born in 1843, Mr. McLeod served in the Civil war and was promoted to the rank of Lieutenant. He was well-known as a philanthropist and famous as the originator of the Smith system of proportionate giving. His systematic beneficence, through which he gave away one-tenth of his income to benevolences and the needy and his book on "How Can I Make the Most of Myself?" gained him renown. Mr. McLeod took particular interest in the youth of his city, sent several young men through college, became vice president of the Hudson River Humane society and was president of the trustees of Troy Central Y. M. C. A. and trustee of Emma Willard school.

Receiver Is Named

Paul T. Norton has been appointed auxiliary receiver for the Kilbourne & Jacobs Mfg. Co., manufacturers of mining and excavation implements. Columbus, O., under $10,000 bond. A similar application was acted upon by the courts at Columbus last month. The appointment was made by Judge Learned Hand in New York in an equity proceeding filed by the Westinghouse Air Brake Co., which asserts a claim of $11,792. The complaint states that the corporation is capitalized at $1,312,500 and has liabilities of $1,342,257, which include a bonded indebtedness of about $500,000. The assets are not stated, but the company is claimed solvent.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

LAFAYETTE MOTORS CORP., Indianapolis, has taken steps to change its corporate status following the removal of its entire plant, equipment, offices and general interests into Wisconsin, at Milwaukee, where it now is resuming production in a new works adjoining the Milwaukee plant of the Nash Motors Co. The Indiana corporation has been granted a charter to operate in Wisconsin as a foreign corporation. The capital stock is given as 30,000 common shares without par value, $3,000,000 first and $4,000,000 second preferred. Charles W. Nash is president.

* * *

JOHNSON SERVICE CO. of Milwaukee, manufacturer of automatic heat regulating appliances, and conducting a brass foundry and machine shop, is preparing to erect an addition to its plant at Jefferson and Michigan streets, which will duplicate the present 8-story building, 60 x 120 feet. According to Harry W. Ellis, president and general manager, the construction will await the action of the Wisconsin legislature with reference to taxation bills now under consideration. The proposed enlargement contemplates an expenditure of from $200,000 to $300,000 in building, machinery and other equipment.

* * *

THE Shunk Mfg. Co., Bucyrus, O., has closed a contract with S. Franklin Henderson, owner of the patents for the exclusive manufacture of a metal truck hoist. It will be manufactured in the former plant of the Allen Motor Car Co., and preparations now are being made for the installation of the necessary machinery. Included in the new equipment will be a furnace, installation of which has been started. Benton Hopkins will be superintendent of the plant. John Q. Shunk is president of the company. The hoist is of such design that it can be used on trucks from two to 10 tons capacity.

* * *

ELECTION of directors and officers was held at the recent annual meeting of the stockholders of the Consolidated Steel & Iron Corp., St. Louis. Directors elected are F. J. Stuart, J. R. Finkelstein, H. A. Brereton, E. J. Schroeder, A. T. Hollenbeck, W. R. Mayne, F. F. Rimsa, Thomas Pechan, James B. Pitcher, F. C. Pitcher, A. R. Fraser, H. A. Sicker, Aug. Borchelt, S. C. McKeen and E. E. Gates. Officers for the ensuing year will be: Chairman of the board and general manager, F. J. Stuart; president, J. R. Finkelstein; vice president, E. J. Schroeder; first vice president, H. A. Brereton; second vice president, F. C. Pitcher; treasurer, J. B. Pitcher and secretary and assistant treasurer, F. F. Rimsa.

* * *

SALES of cast iron pipe being manufactured by the United States Cast Iron Pipe & Foundry Co. under the de Lavaud patent are rapidly exceeding present facilities and additional space for de Lavaud machines is being arranged for at the company's Birmingham, Ala., plant. The directors of the company at their meeting, held recently, authorized an appropriation covering the new machines. This installation will be in addition to the company's proposed 10-machine plant at its Burlington, N. J. works.

* * *

FIRE recently damaged the foundry and machine shops of the Gilson Mfg. Co., Port Washington, Wis. The japanning building, boiler house, a large warehouse and a smaller building were gutted and the machine shop badly damaged. The gray iron shop was saved. Another warehouse, 100 x 200 feet, is being put into shape for use as a machine shop. The Gilson company has large orders for chair and furniture castings as well as gas engines, power truck garden cultivators, etc. Plans for rebuilding the damaged structures are under way. Harry W. Bolens is president and general manager.

* * *

THE Nicholson File Co., Providence, R. I., at its annual meeting Feb. 14, elected the following officers: President and general manager, Samuel M. Nicholson; vice president and treasurer, Paul C. Nicholson; secretary and assistant general manager, Ernest S. Craig; assistant treasurer and cashier, Henry W. Harman; assistant treasurer, Albert J. Dana; assistant secretary and manager of credits, Augustus E. Saunders; domestic sales manager, Wallace L. Pond; foreign sales manager, S. Foster Hunt; assistant to president, Robert W. Hathaway; directors, Samuel M. Nicholson, Paul C. Nicholson, Marsden J. Perry, John Russell Gladding, Byron S. Watson, Ernest S. Craig and Augustus E. Saunders.

* * *

STOCKHOLDERS of the Reading Iron Co., Reading, Pa., have elected as directors, Samuel R. Seyfert, Jefferson Snyder, L. E. Thomas, Randolph Stauffer and J. M. Callen. The directors elected officers as follows: President, L. E. Thomas; vice president, J. M. Callen; secretary, George W. Dulany; treasurer, Henry Y. Yost; assistant treasurer, R. J. Wenger.

* * *

A NUMBER of important changes in officials was made at the annual meeting of the directors of the Stanley Works, New Britain, Conn., held Feb. 14. George P. Hart resigned as chairman of the board of directors and was succeeded by E. Allen Moore, who had been president; Clarence F. Bennett was promoted to the presidency and Ernest W. Christ, secretary, Malcolm Farmer and J. E. Stone were made vice presidents. Officers are: Chairman of the board, E. Allen Moore; president, Clarence F. Bennett; vice presidents, Ernest W. Christ, James E. Cooper, Malcolm Farmer, Walter H. Hart, Philip B. Stanley and J. E. Stone; treasurer, L. W. Young; secretary, Ernest W. Christ; assistant secretaries, P. F. King and M. H. Pease; assistant treasurers, W. B. Wilbur Jr., and R. E. Pritchard. No changes were made in the personnel of the board of directors. The retiring chairman of the board, George P. Hart, who is in the South, remains a member of the board of directors and a member of the executive committee.

* * *

WORK will begin about March 1 on a foundry for the Studebaker Corp., at South Bend, Ind. The building will be of concrete and steel, one-story, 650 x 720 feet. The foundry will have a capacity of 750 complete sets of automobile castings per day.

Iron and Steel Imports Large

Pig Iron Received from Sept. 22 to Oct. 31 Exceeds Preceding 9 Months' Tonnage—Total Is Largest in History—Fordney Tariff Has Little Effect—Iron Ore and Ferroalloy Tonnages Decline

IMPORTS of iron and steel products in the period Sept. 22 to Oct. 31 totaled 163,335 gross tons according to deferred returns to the United States department of commerce, bureau of foreign and domestic commerce, just made available. This is the largest monthly tonnage reported in the history of the modern iron and steel industry. The Fordney tariff became effective Sept. 22. So that the report is the first of import operations under the new law. It tends to show that the tariff has had little or no effect upon the situation.

IMPORTS OF VARIOUS ORES AND FERROALLOYS

Gross tons

	—October—		10 months ending October	
	1922*	1921	1922*	1921
Ferromanganese	11,229	1,943	83,240	8,548
Ferrosilicon	565	1,359	13,339	5,242
Manganese ore	22,523	36,760	350,060	377,834
Tungsten-bearing ore	10	54	1,665	1,341
Nickel ore	247	....	395	904
Total	34,574	40,116	448,699	393,869

*Fordney tariff became effective Sept. 22, 1922, and figures for October include the last eight days of September.

Pig iron imports during the period were the largest ever recorded in any comparable period since 1913. These totaled 120,779 tons, representing a daily importation of approximately 3097 gross tons, and compare with imports of 46,339 tons in the 21 days of September.

IRON AND STEEL IMPORTS

Gross tons

	—October—		10 months ending October	
	1922**	1921	1922	1921
Pig iron	120,779	406	229,950	20,933
Scrap iron and steel	28,677(a)	7,827	88,764	36,773
Bar iron	553	221	4,806	1,596
Steel ingots, bars, etc.	7,736(b)	918	23,947	7,032
Struct'l shapes	1,434	54	3,321	604
Rails and splice bars	2,394	1,126	24,260	18,748
Boiler and other plates	674	15	1,189	1,905
Sheets and saw plates	90			
Tin plate	42	26	2,303	339
Wire rods	27	16	1,330	578
Total	162,406	10,609	379,870	85,686

OTHER IMPORTS

Tubular products	306	*	*	*
Round iron and steel wire	282	*	*	*
Castings and forgings	159	*	*	*
Nails and screws	109	*	*	*
Bolts, nuts, rivets, etc.	31	*	*	*
Flat wire and strip steel	19	*	*	*
Other wire manufactures	16	*	*	*
Wire rope and insulated wire	7	*	*	*
Grand total	163,335			

**Fordney tariff became effective Sept. 22, 1922, and figures for October include the last eight days of September.

*Reclassification makes comparisons of these items impossible.

(a) Tin plate scrap left out in new schedule.

(b) 1922 figures now include shafting.

The returns for October bring total imports of pig iron in the 10 months of the year to 229,950 gross tons. Pig iron now is quotable at 75 cents per ton, whereas previously it was free.

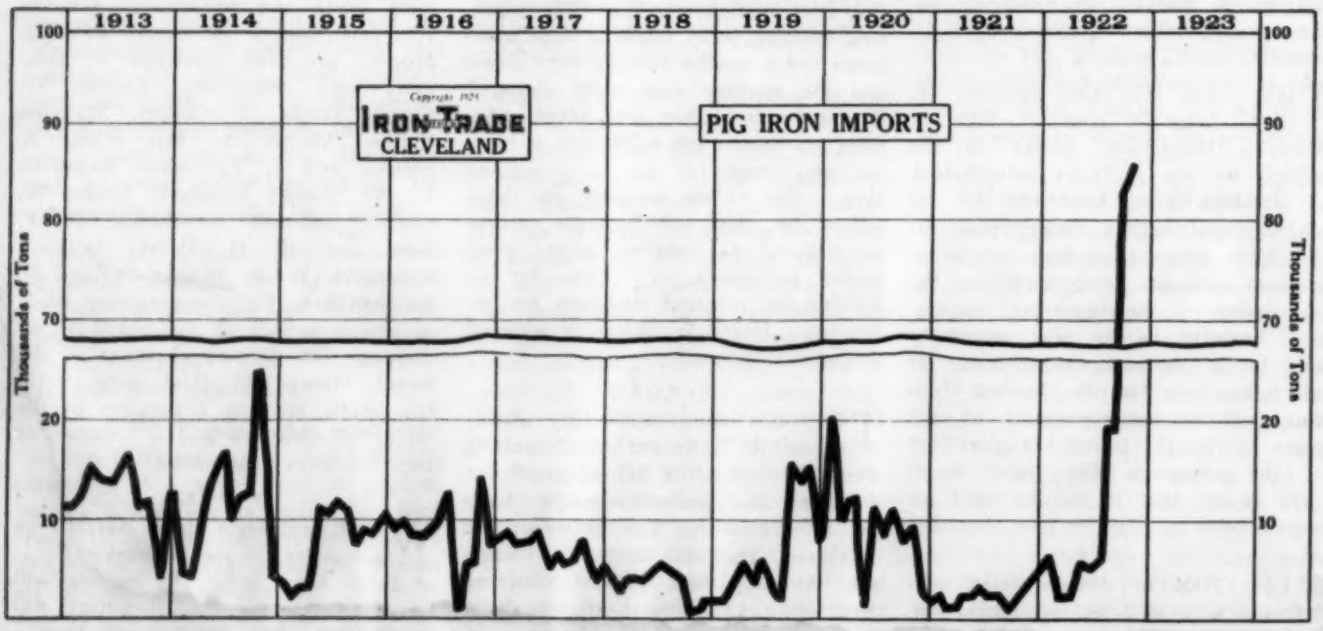
Gains also were made in imports of scrap iron and steel during the period, which totaled 28,677 tons and compare with 12,224 tons in the 21-day period in September, and with 7827 tons in October, 1921; steel ingots, bars, etc., which totaled 7736 tons compared with 1280 tons in September and 918 tons in October, 1921; structural shapes, with a total for the period of 1434 tons compared with 289 tons in the eptember period and 54 tons in the corresponding period in 1921; rails, which totaled 2394 tons compared with 705 tons in September and 1126 tons in October, 1921; and sheets and plates. Losses were recorded in tin and terne plates and wire rods.

IRON ORE IMPORTS

Gross tons

	—October—		10 months ending October	
	1922*	1921	1922*	1921
From:—				
Spain	.....	5,562	39,936	5,602
Sweden	40229	....	260,037	143,234
Canada	401	235	2,155	1,957
Cuba	44,000	....	276,489	112,432
Other couuntries	38,577	41	228,977	38,323
Total	123,207	4,838	807,594	301,548

*Fordney tariff became effective Sept. 22, 1922, and figures for October include the last eight days of September.



HOW THE TREND OF PIG IRON IMPORTS HAS FLUCTUATED IN THE PAST 10 YEARS IS SHOWN. THE HIGHEST POINT REGISTERS THE TOTAL RECEIVED IN THE PERIOD SEPT. 22 TO OCT. 31. TONNAGE FOR BOTH SEPTEMBER AND OCTOBER WAS EQUALIZED INTO DAILY TONNAGES IN ARRIVING AT THE TWO MONTHS' TOTALS

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

B. L. WORDEN, who recently was elected vice president and a director of the Cutler-Hammer Mfg. Co., Milwaukee, to fill the vacancy created through the resignation of A. W. Berresford, noted in the Feb. 8 issue of IRON TRADE REVIEW, founded the Worden-Allen Co., Milwaukee, 25 years ago. Fifteen years ago he founded the Lackawanna Bridge Co., Buffalo, and later purchased the Ferguson Steel & Iron Corp. also of Buffalo. During the past year he disposed of his interests in all three companies, the Lackawanna Bridge Co. and the Ferguson Steel & Iron Corp. being acquired by the Lackawanna Steel Co., while the Worden-Allen Co. was disposed of to the junior stockholders. Six years ago Mr. Worden built the shipyards of the Submarine Boat Corp. at Newark, N. J., which he has operated since. At this yard 150 standardized steel ships have been constructed and at one time vessels were being turned out at the yard at the rate of three per week. Mr. Worden continues his connection with the Submarine Boat Corp. and some of its subsidiary companies. A year ago Mr. Worden was requested to administer the executive affairs of the Beaver Board Companies, and he accepted the position of chief executive of the company, which he still maintains.

G. S. Guthrie has been elected a director of the Niles-Bement-Pond Co., New York.

Clarence G. Stoll has been appointed works manager of the Hawthorne plant, Chicago, of the Western Electric Co.

Frank C. Nichols, vice president of the Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., is making a visit to its European branches.

T. J. Cleary has been appointed southern agent for the Combustion Engineering Corp., New York, with offices at room 702 Candler building, Atlanta, Ga.

Cyril A. Fox also has joined the sales force of the company. He will have charge of sales engineering work in Ohio and West Virginia. Mr. Fox formerly represented the Cortland Grinding Wheel Corp., Chester, Mass.

Gen. Otto H. Falk, president of the Allis-Chalmers Mfg. Co., and vice president of the Falk Corp., Milwaukee, will sail Feb. 20 on a three months, tour of Europe. He will be accompanied by his son.

Arthur Purnell, a member of the New York sales staff of the Youngstown Sheet & Tube Co., Youngstown, O., has been named district manager of the Boston office of the company.

B. L. WORDEN

Raymond O'Brien, formerly connected with the Allan Coal Mining Co., New York, has been appointed manager of coal and coke sales in the New York district for the Iron Trade Products Co., Pittsburgh.

J. F. Reinier has resigned as president of the Wainwright Trust Co., Noblesville, Ind., effective March 1, and will devote all his time to the New Process Steel Co. which soon will start its plant in Noblesville. He is president of the company.

Richard W. Tull has been appointed manager of sales in the New York district for Littleford Bros., of Cincinnati, manufacturers and erectors of steel plate and sheet construction. Mr. Tull, prior to January, 1921, was contracting manager for the Eastern Steel Co. and since then sales agent in New York for the Montgomery Iron & Steel Co.

Carroll M. Lawton, for the past two years associated with the Charter Oak Motor Car Co., Hartford, Conn., again has joined the sales force of the Manhattan Rubber Mfg. Co., Passaic, N. J., manufacturer of rubber-bond grinding wheels and mechanical rubber goods. Mr. Lawton is connected with the company's abrasive wheel department in the capacity of sales engineer for the New England states.

F. S. Wheeler has been elected chairman of the American Can Co., and H. W. Phelps has been elected president to succeed Mr. Wheeler. Mr. Wheeler's election follows the withdrawal of D. G. Reid as chairman because of ill health. Mr. Reid will remain a member of the board. Mr. Phelps formerly was one of the proprietors of the Union Can Co. which was acquired by the American Can Co. at its organization. He since has been actively connected with the company and has been a vice president since 1912.

H. G. Smith has been appointed vice president in charge of sales of the Bethlehem Shipbuilding Corp. with offices at 25 Broadway, New York. Mr. Smith graduated from the United States naval academy in 1891 and studied naval architecture at the Royal Naval college, Greenwich, England. He has served as naval constructor in the United States navy and later was identified with the Bethlehem Shipbuilding Corp. in various capacities, his last previous office having been assistant to the president of the company.

W. J. Corbett has been engaged by the Electric Steel Founders' Research group as industrial engineer to be associated with R. A. Bull, research director of the group, in the increased activities proposed through expanding the work of the committee on new uses for steel castings. Mr. Corbett's engineering training was

supplemented by several years experience in the plants of the American Steel Foundries, also in the steel foundries of the Watertown arsenal and the Erie Forge Co. Mr. Corbett's headquarters will be at the group's central office, 639 Diversey Parkway, Chicago.

John M. Henry, for several years advertising manager of the Pratt & Whitney Co., Hartford, Conn., has joined the advertising department of the Penton Publishing Co., Cleveland. He was connected with the Pratt & Whitney company for about eight years serving first in the engineering department on tool and gage design and later as assistant research engineer. Before joining the Pratt & Whitney organization he was with the Hart & Cooley Co., Hart & Hutchinson Co. and the Fafnir Bearing Co., New Britain, Conn., in various capacities. During the war he was associated with the Winchester, Remington and Westinghouse organizations on equipment design for the interchangeable manufacture of military rifles, big guns and howitzers.

J. C. F. Yarnell has resigned his connection with the Western Drop Forge Co. in order to devote his entire attention to the interests of the Clark Bros. Bolt Co., Milldale, Conn., of which he has been appointed western sales manager with offices at 2671 West Grand boulevard, Detroit. In a recent announcement concerning Mr. Yarnell's connection with the Clark company the address of the latter was given as Pittsburgh. This was in error.

H. R. Blickle, formerly vice president and consulting engineer, has been elected president of the Fort Pitt Bridge Works, Pittsburgh and Canonsburg, Pa., to succeed Theodore A. Straub who has resigned on account of illness. S. B. Knox, formerly eastern contracting engineer, has been elected vice president to succeed Mr. Blickle, and P. B. Straub continues as secretary-treasurer.

E. C. Rock has been appointed district manager of sales at Cleveland, with headquarters at 544 Kirby building, for the Wyckoff Drawn Steel Co., Frick building, Pittsburgh. He formerly was Cleveland manager for the Columbia Steel & Shafting Co., Carnegie, Pa., and for the past 18 months or so has been in charge of the Chicago office of the Columbia company.

John T. Brierly, Holden, Mass., has retired as president of the Thompson-Copeland Co., Worcester, Mass., and has been succeeded by William J. Denholm, who was president of the National Sales Co., of that city. Other officers elected at the annual meeting Feb. 16 were: vice president and clerk, E. A. Copeland; treasurer, H. C. Thompson; directors, the officers and Mr. Brierly.

M. E. Pollak, who has been elected president of the Pollak Steel Co., Cincinnati, as noted in the Feb. 8 issue of IRON TRADE REVIEW, succeeds his father Emil Pollak, who has been active head of the company for years. Mr. Pollak has been closely associated with the iron and steel business for the past 26 years and takes up his new duties well qualified to discharge their executive requirements. After attending the University of Cincinnati, he entered the shops of the Pollak

M. E. POLLAK

company's Cincinnati plant, and after mastering the details of manufacture was made superintendent. With the the expansion of the company he began giving its executive affairs closer attention and presently was made vice president. Mr. Pollak maintained a close personal study of all phases of the labor question particularly in connection with the employes in the company's shops. During the war he was closely connected with the war and liberty loan campaigns. He is a director of the Drop Forging institute, and is an officer and director of two Cincinnati banks. He has been closely connected with various philanthropic organizations and was organization chairman of the 1922 Cincinnati, community fund drive, which succeeded in raising $1,700 000. Mr. Pollak is 46 years of age.

J. M. Willis, at present general manager of the Baltimore dry docks of the Bethlehem Shipbuilding Corp., Ltd., South Bethlehem, Pa., on March 1, will take charge as general manager of the consolidated shipbuilding and ship repairing interests of the company in the Baltimore district. The consolidated plants, of which he will have charge include the Baltimore Dry Docks Works and Sparrows Point Works of the Baltimore plant.

C. A. Anderson, Jr. has been appointed general sales manager of the Pittsburgh Valve Foundry & Construction Co., Pittsburgh, succeeding James D. Robertson, resigned. Mr. Anderson formerly was Philadelphia district manager of the company.

B. T. Cummings, who has been assistant to W. C. Dickey, district manager of sales in the New York office of the Brier Steel Co., Youngstown, O., for about seven years, has accepted a position as manager of the sheet and tin plate department of J. K. Larkin & Co., New York. Before joining the Brier Hill staff Mr. Cummings was in the New York office of the American Sheet & Tin Plate Co., and had been with that company nine years.

Daniel G. Ried has resigned as chairman of the board of directors of the American Can Co., New York, and has been succeeded by F. S. Wheeler. Mr. Reed will continue as a member of the board. H. W. Phelps has been elected president of the company, and Harry Craver was made a director of the company to succeed Franklin Rudolph, deceased. Mr. Reid resigned because of ill health.

B. H. Bristow Draper, vice president of the Draper Corp., Hopedale, Mass., has been elected treasurer to succeed the late George Albert Draper, his uncle.

William LaCoste Neilson, vice president and general sales manager of the Norton Co., Worcester, Mass., will represent the Worcester Chamber of Commerce at the general meeting of the International Chambers of Commerce in Rome, March 18-24. He sailed for England, Jan. 30.

Willard G. Nims has succeeded the late L. S. Starrett as president of the Athol Mfg. Co., Athol, Mass., L. E. Carpenter has retired as vice president and general manager and has been succeeded by Arthur H. Starrett as vice president and by Spencer A. Reed as treasurer and general manager.

Francis M. Conlon, formerly assistant superintendent of the Worcester Pressed Steel Co., Worcester, Mass., has accepted the superintendency of the Weirton Steel Co., Weirton, W. Va.

Railroad Tool Orders Pending

Many Large Shop Equipment Lists from Carriers Are in the Market—General Industrial Demand Limited to Single Tool Orders—Inquiries Are Numerous —Improvement in Crane Demand

PENDING business from the railroads continues to feature the machine tool and shop equipment market. Buying is not sizable and inquiries from the trade in general are not large continuing to be of the same character as in the past few months, namely for single tools. However, the railroads continue to show interest in machinery although large orders are few. Lists of size, on which early action is expected, are in the market from the St. Louis-San Francisco, the Norfolk & Western, the New York Central, the New York, New Haven & Hartford, the Santa Fe and several others.

The automotive industry continues to furnish the bulk of machine tool demand from the general manufacturing trade. However, this is not as large as formerly, at least not for standard tools. Electrical equipment manufacturers are steadily increasing their operations and considerable tool buying is expected by these interests shortly. The General Electric Co., Schenectady, N. Y., continues a persistent buyer and all of its needs are not yet filled. The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., continues to make intermittent purchases. Approximately $150,000 of forging machinery was bought during the past few days by the McClintic-Marshall Co., Pittsburgh. This company is expected to close shortly on a quantity of machine tools while other prospective machine tool purchasers are the Guibert Steel Co., the Pressed Steel Car Co., the American Metallic Packing Co. and the Parker Appliance Co.

Metalworking shop operations are steadily improving. Indicative is the report from Milwaukee to the effect the betterment in business in the iron and steel products industries was directly responsible for a large gain in employment during the past month in that district. This probably would apply in other districts. One manufacturer of heavy machinery employing 775 in January, now has 1175 at work. In the East machinery dealers and manufacturers report the bulk of their orders is coming from the Middle West. This probably is due to the fact the automotive industry continues to purchase machinery for replacement purposes in order to maintain its necessary high production rate. Machine tool prices still are advancing, several increases being noted recently.

Inquiries and orders for cranes are improved. Orders, however, are not large. A large inquiry recently was placed current by the Metal & Thermit Corp. This involves several overhead traveling cranes of various sizes and capacities.

Orders for Shop Equipment Small and Scattered

NEW YORK, Feb. 20.—Scattered orders, involving principally single items, comprise trading in machine tools here. In fact, were it not for a few fair-sized railroad inquiries and the unusual activity in other branches of industry, the local market would take on a dull aspect. The biggest list pending is that of the Norfolk & Western, comprising 43 items and mentioned last week. The New York Central has added a few items, including a 30-inch lathe and some flue equipment. The New York, New Haven & Hartford has added

Crane Awards and Inquiries of the Week

Orders Placed

One 10-ton electric overhead crane for Thomas Steel, Holyoke, Mass., to Niles-Bement-Pond Co.

Two 40-ton electric overhead cranes for a tender shop of the Baldwin Locomotive Works, Philadelphia, reported last week as placed, went to the Milwaukee Electric Crane & Mfg. Co.

One 10-ton electric crane and one 15-ton, both with 40-foot span, for the Genereal Electric Co., Schenectady, N. Y., to Alfred Box & Co.; and one 10-ton electric crane with 53-foot span, to the Northern Engineering Works. This latter is in addition to a 3-ton electric crane recently reported as going to the Northern company.

One 8-ton electric crane with 80-foot span and equipped with bucket, for the Giant Portland Cement Co., New Egypt, Pa., placed through Lincoln H. Smith, engineer, Philadelphia, with unnamed bidder.

One 15-ton overhead crane for the Lancaster Iron Works, Lancaster, Pa., to Alfred Box & Co.

One 15-ton electric traveling crane for the Pottstown Iron Works, Pottstown, Pa., to the Niles-Bement-Pond Co.

One 7½-ton electric crane for the Mountain Ice Co., Newark, to the Detroit Hoist & Machine Co.

One 6-ton, 1-motor crane, 18-foot, for Eastern Steel Castings, Newark, N. J., to Hoist & Crane Engineering Co. and two 10-ton electric cranes, reported going to Pawling & Harnischmeger Co.

One 2-ton electric crane, 30-foot span, for Waterbury, Vt., to New Jersey Foundry & Machine Co.

Two each 5-ton and 7½-ton cranes for the McClintic-Marshall Co.'s new rivet plant at McKees Rocks, Pa., to the Shaw Electric Crane Works, Muskegon, Mich.

One each 3½ and 7½-ton cranes for the Riter-Conley Co., Pittsburgh, to the Shaw Electric Crane Works, Muskegon, Mich.

Orders Pending

One 120-ton wrecking crane with 30-ton auxiliary, for the Southern Pacific railroad, 165 Broadway, New York City, bids asked.

One used 10-ton electric gantry, 60-foot span, for interior operation in the foundry of Woodward Iron Co., Woodward, Ala., bids asked.

One 5-ton, 3-motor, alternating current, cage-controlled crane with 70-foot span for the Sprague Electric Works, New Kensington, Pa.; bids being taken.

One 10-ton crane for the Superior Steel Corp., Pittsburgh; abandoned.

Three 125-ton ladle cranes, Carnegie Steel Co., Duquesne works, Pittsburgh.

Gantry cranes for dock at Pittsburgh for Carnegie Steel Co.; matter still in abeyance.

Cranes for improving South Side Plant at Pittsburgh of the Jones & Laughlin Steel Corp.; matter in abeyance.

One 75-ton, one 40-ton, one 15-ton and three 10-ton traveling cranes for the Metal & Thermit Corp., new sheet mill, South San Francisco.

One coal-handling crane with 30-foot span for the Knoxville Iron Co., Knoxville, Tenn.

a double-end punch and shear. While its list comprises about a half dozen tools, it is estimated the expenditure will amount to about $30,000, as most of the machines are heavy.

Eastern machine tool builders assert that while their plant operations are better as compared with a few weeks ago, the bulk of their business has come from other sections of the country, particularly the Middle West where the automotive industry has bought substantially. They point out, however, that equipment for the automotive industry has in a number of respects become so specialized that there is not as big a demand for standard machine tools as is generally supposed.

Crane orders continue to be placed in fairly good volume, although new inquiry the past week has not been impressive.

Bolt and Nut Makers Buying

BOSTON, Feb. 20.—While actual sales during the past week show little improvement, close observers feel that the expected heavy buying period in the machine tool market is close at hand. Inquiry shows a decided improvement. Bolt and nut manufacturers are busy, and as the tool equipment in this particular line has been allowed to fall behind during the last few years, an urgent demand for new tools is developing. Most sheet metal workers, such as boiler makers and railway repair shops, either are starting to buy or else are preparing lists of tools which they expect to cover within the next few weeks. One of the principal Boston dealers after a trip from one end of the district to the other reports pending machine tool business in every city where he stopped. Several Maine paper manufacturers are in the market for tools. Massachusetts textile interests are busy, and several have placed orders for tools during the past week. Electrical manufacturers are enjoying improved orders and some early tool buying is expected from this field. The General Electric Co. during the week has bought a few tools for its Pittsfield plant and also for its Lynn plant. At least two of the New England railroads are working on fairly attractive lists of machine tools. The tool demand from railroads throughout the country is strong and New England manufacturers of railroad shop equipment are forced to turn away business because their plants are overcrowded.

New tool sales of the past week include several shapers, automatic screw machines, and other equipment to Connecticut hardware companies, a heavy drop hammer to a textile interest, four small tools to a new interest starting up in Massachusetts, and other individual tools placed with scattered users throughtout the district. Boston dealers report approximately 20 used tools sold.

Inquiry for cranes has renewed strength. One dealer reports two inquiries for 40-ton cranes which he expects will be closed during the coming week. Power plant equipment manufacturers report business in February to date far in excess of the rate in January.

Equipment Demand Is Featureless

PITTSBURGH, Feb. 20.—Described as being practically normal, the machine tool and equipment market offers no outstanding features. Occasionally orders and new inquiries are noted for both machine tools and cranes and in connection with the latter type of equipment this past week at least two crane orders involving four items each are noted. In connection with one of these the details are withheld for the time being but will be issued at an early date. The other is the purchase by the McClintic-Marshall interests of four cranes for a rivet plant at McKees Rocks, Pa. For this plant practically $150,000 of forging equipment likewise has been purchased within the past few days and the machine tools are scheduled to be awarded soon. The Westinghouse Electric & Mfg. Co. continues to make intermittent purchases on its large list for various operations. Most of the current buying in this field, however, is of independent tools rather than of groups. Practically every dealer in this city reports the disposal of several single items, some of them small tools although two large shears and one large milling machine, a 16-inch shaper and another milling machine are noted among recent purchases by local manufacturers. The Bevis & Shartle Machine Co., Middletown, O., is inquiring for some equipment, and the Shail Mfg. & Machine Co., Wheeling, W. Va., may do so at an early date. Included among the local companies, in addition to the McClintic-Marshall and Westinghouse interests referred to above, in the market for machine tool equipment are the Guibert Steel Co., the Pressed Steel Car Co., and the American Metallic Packing Co.

Demand Reflects Business Improvement

SAN FRANCISCO, Feb. 15.—Equipment demand in this district continues to reflect the improvement in business generally. Orders are not exceptionally large, the bulk being for single tools. New projects are developing in this territory daily and hope is held out by machinery interests here that these will furnish a large equipment demand in the near future.

Crane orders are not large. Inquiries for this class of equipment are not exceptionally numerous nor sizable, although the volume of business in prospect is considerably larger than that of the past few months. It is understood here that the Metal & Thermit Corp., South San Francisco, will receive bids through its New York office for one 75-ton, one 40-ton, one 15-ton and three 10-ton overhead traveling cranes for its proposed sheet mill. It is also understood by crane interests here that the Knoxville Iron Co., Knoxville, Tenn., is in the market for a coal-handling crane with 30-foot span to handle 500 tons of coal in 12 hours. It is stated H. W. Benschoten signed this latter inquiry.

Inquiries and Sales Increasing

CHICAGO, Feb. 20.—Inquiry for machine tools is increasing, as are sales. Both are scattered and involve single tools or at most a small number. Large lots are entirely missing. Hope for the immediate future is found in the fact a number of users are figuring on their requirements and probably will be in the market soon. General business is improving to an extent that more equipment is needed in most shops. The Santa Fe railroad has issued a list of woodworking tools and is preparing what is expected to be a large list of metalworking equipment which should be issued for bids shortly. This equipment is for various shops along its lines and information is that it will contain a wide variety of tools. Large industral companies continue to buy sparingly and as the need arises without issuing formal inquiry. At Detroit demand from automotive builders is sufficient to give an unusually active situation.

Outlook for New Demand Promising

MILWAUKEE, Feb. 20.—The outlook for new business in metalworking machinery is more promising than it has been in two years or more, and the betterment noted in demand since early last fall is increasing. The feature of the Feb. 15 issues of the monthly publication of the largest Milwaukee bank, is that iron and steel products industries were principally responsible for a gain of 4.4 per cent in employment during the past month.

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Mr. Geo. W. House, 1822 Ford Building, Detroit, Mich.
The L. D. Rockwell Co., 1201 National Bank Building, Cleveland, O.
The Maynard French Steel Co., 516 Mercantile Library Bldg., Cin., O.
Walter G. Clark, Inc., 106 N. Third St., St. Louis, Mo.
Walter G. Clark, Inc., 313 American Bank Bldg., Kansas City, Mo.
Mr. C. H. Beach, 617 Merchants Bank Bldg., Indianapolis, Ind.
Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.
Mr. Herbert P. Hill, 401 Continental Trust Bldg., Washington, D. C.
Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.
Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.
Wm. P. Horn Co., Dekum Building, Portland, Ore.
Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.
Mr. Edwin Schofield, 45 Jarvis St., Toronto, Ont., Canada.

and the gain was well distributed, although mainly in automobile parts. It also is pointed out that a manufacturer of heavy machinery employing 765 in January last year now has 1175 at work. Metal trades firms all show large increases in unfilled orders and sales. Especially encouraging is the statement that a farm implement maker added 200 men in the past month and the motor truck industry is showing substantial gains, one representative firm having reached 88 per cent of capacity, against 44 per cent a year ago. An automobile and motor concern is working with three times as many men as it did a year ago. Toolroom and production floor equipment so far has been subject mostly to replacements, but as firms get nearer the point of absorbing all capacity, the prospects for new tool business is brighter.

Inquirers Reluctant To Close on Needs

CLEVELAND, Feb. 20.—Individual orders for machine tools continue confined to single tool units. Inquiry continues in heavy volume but users defer purchases, evidently being reluctant to add to their present facilities until they have further confidence in a continuance of demand for their products. Indicative of this is the report of one local dealer to the effect that within the past three weeks it has received fully 25 inquires from users scattered throughout the country and involving from one to 20 tools, and in only one instance has it received a reply to its letter furnishing quotations. While this is somewhat exceptional other dealers here report considerable difficulty in closing on orders after furnishing quotations.

During the week a local dealer disposed of a riveting machine to a Cleveland user, while another dealer sold two vertical milling machines to a Cleveland buyer. A Muncie, Ind., gear maker recently closed on a quantity of gear hobbers, several of which were secondhand machines taken from a Cleveland dealer. This latter interest during the week purchased a milling machine from the same dealer. A number of orders were placed by automotive interests in this district and Detroit, but this buying is lighter than was experienced some time back. The Worldseye Co., which recently established a plant at 5209 Prospect avenue this city, for the manufacture of motion picture projection machines, recently installed a quantity of precision machinery and special tools.

Recent inquiries include one for seven gear generators issued by a local manufacturer. Another comes from the Parker Appliance Co., this city, which is in the market for spindle automatic screw machines with a capacity for ¾-inch stock, to be used in the manufacture of couplings; several adjustable multiple spindle drilling machines, and a number of hand screw machines. There are numerous single tool inquiries current, many of which have been in the market for some time.

The price situation in the machine tool market still is unsettled. Price advances continue to be noted from week to week, most of them being attributed to higher labor and material costs. Within the past few days a line of shapers was advanced between 7 and 10 per cent while quotations on a line of milling machines was advanced a like amount.

Auction sales of surplus equipment and equipment placed on the market through receiverships, etc., continue to hold the attention of buyers in this district. An interesting development of the week along this line was the order of United States District Judge Westenhaver authorizing the sale of the properties of the Standard Parts Co., this city. The sale will be opened March 29 and will include the 11 plants of the company situated at various points, as well as the equipment. At least one dealer in Cleveland is interested in the offer of an Elyria interest to dispose of approximately 30 miscellaneous machines. Another auction of interest to buyers here is that scheduled for today at Harrison, N. J., of the surplus machinery, tools and equipment by order of the Hyatt Bearings division of the General Motors Corp. This equipment includes automatics, presses, drill presses, hand screw machines, cut-off machines, milling machines and general equipment, such as pumps, electric furnace, tumbling barrels, sand blast machine, etc.

Crane manufacturers in this district are optimistic as regards the outlook for future business. Present orders are not exceptionally large but new inquiries are being received at a pleasing rate. Makers report the majority of their orders are coming from other districts. A resumption of factory construction programs, reported in various sections of the country, is pointed to by manufacturers of this class of equipment, as a forerunner of a demand of size within the near future.

Prospective Demand Is Encouraging

TORONTO, Ont., Feb. 20.—Machinery and machine tool dealers continue to report a good demand for machinery. Both the prevailing demand and prospective business is improving and those interested in the market are optimistic with regard to the future. While no large lists made their appearance during the week, a number of orders were closed for single tools and a few orders calling for two or three machines or tools were also placed on dealers' books. During the past few weeks additional interest has been taken in the market by mining interests and the demand for this class of equipment has been showing steady improvement. The automobile industry is furnishing the greater part of the demand for equipment at present and with the completion of building operations on plants at Toronto, London, Ford, Walkerville, and other industrial centers this business will be greatly stimulated. Another field that is proving a good source for the disposal of equipment is that relating to power developments. Several undertakings of this nature are to be started during the year which will represent expenditures of many millions of dollars. Conveying and carrying machinery for grain elevators also is becoming more active and those companies building this class of equipment are being approached by large grain interests for prices on equipment for elevators at Montreal, Fort Willian, and on the Pacific Coast.

The Western Terminal Elevator Co., Winnipeg, Man., will purchase conveying and elevating equipment for a proposed elevator at Fort William, Ont., to cost $500,000. The Western Canada Flour Mills, Toronto, Ont., is interested in equipment for an elevator addition at Goderich, Ont., to cost $300,000. The Bawlf Grain Co., Winnipeg, Man., is receiving bids for the erection of a grain elevator at Port Arthur, Ont., to cost $900,000; also for necessary machinery. Bids will be received by E. A. Woodward Co., Ltd., Winnipeg, Man., for the erection of a grain elevator at Vancouver, B. C., to cost $640,000. Bids will be received by Watt & Blackwell, architects, for the erection of a $15,000 factory at London, Ont., for the Orange Crush Bottlers, Ltd., and prices are wanted on material and machinery. George McIntyre, Burlington street, Toronto, Ont., is asking for prices on equipment for a stone cutting factory. The British Empire Steel Corp., Montreal, Que., has in prospect considerable improvements to its equipment. The company contemplates complete renewal on a large scale of the coal-carrying equipment, which will probably comprise an order for 200 40-ton capacity steel cars and 500 15-ton wooden hopper cars.

The Chester Times, with a circulation in excess of 13,000 is a newspaper that would be a credit to a city many times larger than Chester, Pa., from the standpoint of its clean-cut appearance and able handling of the news.

By C. J. STARK

(Editor, Iron Trade Review)

Liquidation stamped its mark heavily upon the iron and steel industry in 1921. It dictated buying and selling policies and consequently controlled the curves of prices and production. It forced continuing readjustment in a steadily downward scale until, capacity of output and of consumption considered, the industry was driven to the lowest point in its history before an equilibrium was reached in July. The year stands out even among past periods of great depression as one of the severest in trials and hardships for producers ever known. Peculiarly it was a time of reaction coming as the sequel to the feverish conditions of 1920. It strongly accented how unstable and artificial that market had been.

Uncertainty was the dominant note of the iron and steel situation at the beginning of 1921. A year of severe

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East of the Mississippi River

BESSEMER, ALA.—The Imperial Pipe Foundry plans extensions to its plant.

BIRMINGHAM, ALA.—The Birmingham Machine & Foundry Co. has broken ground for the erection of a plant addition.

BRIDGEPORT, CONN.—The Bassick Mfg. Co., of Chicago, and the Bassick Co. of Bridgeport, are to merge into a joint holding company under the name of the Bassick Alemite Co. Incorporation will be under Delaware laws. The local plant will be enlarged.

MERIDEN, CONN.—The trolley barns of the Connecticut Co. recently were damaged by fire.

WATERBURY, CONN.—A 3-story plant addition, 60 x 100 feet, will be erected here by the American Metal Hose Co.

CHICAGO—The Brady Conveyors Corp. has increased its capital stock from $10,000 to $50,000.

CHICAGO—The Automoboat Mfg. Co., 408 First National Bank building, has been incorporated with 650 shares of no par value by Frank C. Layhe, Hazel Mildred Layhe and Jack M. Bradford.

CHICAGO—The Paramount Textile Machinery Co., 337 South Madison street, has been incorporated by Henry Pope, W. H. Bretall, and L. H. Oswald. The company is represented by Boyle & Mott, Merchants Loan & Trust building.

CHICAGO—The H. L. Fisher Mfg. Co., Inc., 4100 Ravenswood avenue, has been incorporated by Harvey L. Fisher, Milan H. Fisher and M. M. Guthrie. The company is represented by Leslie W. Fricke, 726 Monadnock block.

CHICAGO—The Knickerbocker Mfg. Co., 2335 West Van Buren street, recently incorporated with $50,000 capital stock, will manufacture shower baths. It has rented a 2-story brick plant, 80 x 125 feet. A. W. Kimbell is president.

CHICAGO—The Marvel Oil Burner Co., 239 West Madison street, has been incorporated with $50,000 capital stock to manufacture and deal in oil burning appliances, etc., by John A. Russell, Robert P. Rollo and Herbert Bebb. The company is represented by John A. Russell, 850 First National Bank building.

CICERO, ILL.—L. A. Cohn & Bro., Inc., 5429 West Roosevelt road, has been incorporated to manufacture and deal in machinery products of iron, etc., with $250,000 capital stock by Lee Cohn, Max S. Cohn and L. A. Cohn. The company is represented by B. B. Morris, 1001 Conway building, Chicago.

ELGIN, ILL.—The Elgin Piston Pin Co., 300 Moseley street, has been incorporated with $6000 capital stock by George L. Kirk, Herbert A. Fletcher and George J. Wattocks Jr. The company is represented by Arthur L. Paulson, Home Bank building.

MOLINE, ILL.—The Standard Machine & Tool Corp., 113 Seventeenth street, has been incorporated with $10,000 capital stock by E. J. Aspengren, G. B. Gaylord, and C. A. Cook. The company is represented by Kenworthy, Dietz, Shalberg, Harper & Sinnett, Peoples Bank building, this city.

ROCKFORD, ILL.—The Estwing Mfg. Co., Inc., Tenth street and Twentieth avenue, has been incorporated with $10,000 capital stock to manufacture and deal in tools, hardware, etc., by E. O. Estwing, John Nordholm and Morris Nelson. The company is represented by N. P. Nelson, 323 Seventh street.

BRAZIL, IND.—The Brazil Machine & Foundry Co. recently was damaged by fire. The company manufactures clay-working machinery and meter boxes.

CRAWFORDSVILLE, IND.—The Crawfordsville Wire & Nail Co. has increased its capital stock from $150,000 to $450,000.

MARION, IND.—The Marion Tool Works, Inc., has been organized with $10,000 capital stock to manufacture tools, etc., by E. B. Leight, W. H. Mitchell and Edwin F. Leigh.

MARION, IND.—The Steelcraft Engineering Co. has been organized with a capital stock of $50,000 to manufacture machinery, by L. M. Wiley, R. R. Wiley, John Matter, Milton Matter and H. M. Serviss.

ASHLAND, KY.—The chemical laboratory at the plant of the American Rolling Mill Co. recently was damaged by fire.

HARRISON, KY.—The Delker Bros. Buggy Co. has increased its capital stock from $100,000 to $200,000.

LOUISVILLE, KY.—The Lawler Machinery Co. has been incorporated by Dan W. Lawler, C. L. Lawler and Benedict Elder with a capital stock of $10,000.

LOUISVILLE, KY.—The Charles Buddeke Coal Co., 901 Logan street, plans the installation of mechanical equipment for unloading and elevating coal from cars.

LOUISVILLE, KY.—The Kentucky Mfg. & Plating Co. has been incorporated with $25,000 capital stock by D. S. Taylor, John B. Hampton, Thomas H. Buchanan and Paul F. Semonin.

BALTIMORE—The C. D. Prudden Corp.,

Business Changes Recently Announced

COOLEY-WRIGHT Mfg. Co., Waterbury, Conn., has been appointed sole distributing agent for the chilled shot manufactured by the Globe Iron-Crush & Shot Co., Mansfield, O., in the states of Maine, New Hampshire, Vermont and northern New York.

* * *

The Eastern Fuel Co. has moved its New York office from 302 Broadway to 17 Battery Place.

* * *

Van Dyke Hardware & Mfg. Co., Seattle, has changed its name to the General Hardware Co. and increased its capital stock from $20,000 to $30,000.

* * *

The corporate name of the Northern Indiana Brass Foundry Co., Elkhart, Ind., has been changed to the Northern Indiana Brass Co.

* * *

John Hankin & Bro., engineer, machinist and contractor, have moved from 550-552 West Twenty-fifth street to 220 Cherry street, New York city.

* * *

Crocker Bros., pig iron, coke, ferroalloys, etc., are moving their Boston office from 53 State street to 201 Devonshire street. C. C. Boyden is in charge of the office.

* * *

J. Allan Armstrong, Michigan agent for the Allegheny Steel Co., has removed his offices from 1436 Dime Bank building, Detroit, to suite 9-245 General Motors building, that city.

* * *

A New York sales office has been opened in the Park Row building, that city, by the Harrisburg Mfg. & Boiler Co., Harrisburg Pa. The company, which manufacturers boilers, tanks, etc., also makes a specialty of contracting to build entire lines of machinery for companies not having their own shops.

ANOTHER LINK-BELT SYSTEM OF COAL STORAGE

HERE is a simple system of storing and reclaiming coal. With only one man to operate it, coal or any bulk material can be stored and reclaimed at any normal capacity per hour. It is called the Link-Belt Power Hoe. It has proved its effectiveness in many cases where a low-first-cost system was desired.

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Link-Belt has specialized in building coal storage plants to meet all kinds of conditions and requirements — large and small. Our engineers have developed many successful plans out of their experience. The benefit of their advice is yours for the asking.

If you want to store and reclaim coal economically, talk the matter over with Link-Belt experienced Engineers. If you are not quite ready, send for Link-Belt booklets on coal storage.

We design and build complete coal and ashes conveying machinery—The Peck carrier—"chain and bucket" conveyors—flight conveyors—belt conveyors—coal crushers—coal storage systems—locomotive cranes—crawler cranes—skip hoists—portable loaders—electric hoists—power transmission machinery. Catalogs sent on request.

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Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.215c
Buffalo	3.25c
Chicago	2.95c
Cincinnati	3.10c to 3.25c
Cleveland	3.10c
Detroit	3.10c
New York	3.19c
Philadelphia	3.15c
San Francisco	3.40c
Seattle	3.75c
St. Louis	3.05c
St. Paul	3.05c
Los Angeles	3.50c

IRON BARS

Boston	3.215c
Buffalo	3.10c
Chicago	2.95c
Cincinnati	3.10c to 3.25c
Detroit	3.10c
New York	3.19c
Philadelphia	3.15c
St. Louis	3.05c

SHAPES, STRUCTURAL

Boston	3.315c
Buffalo	3.35c
Chicago	3.05c
Cincinnati	3.20c to 3.35c
Cleveland	3.16c
Detroit	3.20c
New York	3.29c
Philadelphia	3.25c
San Francisco	3.40c
Seattle	3.75c
St. Louis	3.15c
St. Paul	3.15c
Los Angeles	3.60c

PLATES

Boston	3.315c
Boston 3/16-inch	3.04c
Buffalo	3.35c
Chicago	3.05c
Cincinnati	3.20c to 3.35c
Cleveland	3.16c
Detroit	3.20c
Detroit 3/16-inch	3.40c
New York	3.29c
Philadelphia	3.25c
Philadelphia, ¼-inch	3.47c
San Francisco	3.50c
Seattle	3.75c
St. Louis	3.15c
St. Paul	3.15c
Los Angeles	3.75c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.215c
Buffalo	4.05c
Chicago	4.00c
Cincinnati	4.00c
Cleveland	3.65c to 3.76c
Detroit	3.95c
New York	4.19c
Philadelphia	3.85c
San Francisco	4.50c
Seattle	4.85c
St. Louis	4.10c
St. Paul	4.25c
Los Angeles	4.70c

NO. 28 BLACK SHEETS

Boston	5.40c
Buffalo	4.85c
Chicago	4.85c
Cincinnati	4.75c
Cleveland	4.25c
Detroit	4.65c
New York	4.80c to 4.90c
Philadelphia	4.60c
San Francisco	6.05c
Seattle	5.85c
St. Louis	4.95c
St. Paul	5.10c
Los Angeles	6.10c

NO. 28 GALVANIZED SHEETS

Boston	6.40c
Buffalo	5.85c
Chicago	5.85c
Cincinnati	5.75c
Cleveland	5.25c
Detroit	5.65c
New York	5.80c to 5.90c
Philadelphia	5.75c
San Francisco	6.90c
Seattle	6.85c
St. Louis	5.95c
Los Angeles	6.90c

BANDS

Boston	4.40c
Buffalo	4.05c
Chicago	3.70c
Cincinnati	3.85c to 4.00c
Cleveland	3.86c
Detroit	3.90c
New York	3.99c
Philadelphia	3.95c
San Francisco	4.05c
Seattle	4.75c
Los Angeles	4.40c

HOOPS

Boston	4.90c
Buffalo	4.35c
Cleveland	3.86c
Detroit	4.20c
New York	4.59c
Philadelphia, 1 inch and wider 20 gage and heavier	4.25c
Seattle	5.00c

COLD ROLLED STEEL

Boston (rounds)	4.15c
Boston (shapes)	4.65c
Buffalo (rounds)	4.10c
Buffalo (shapes)	4.45c
Chicago (rounds)	3.95c
Chicago (shapes)	4.45c
Cincinnat (rounds)	3.90c
Cincinnati (shapes)	4.40c
Cleveland (rounds)	3.90c
Cleveland (shapes)	4.40c
Detroit (rounds)	3.95c
Detroit (shapes)	4.45c
New York (rounds)	4.05c
New York (shapes)	4.55c
Philadelphia (rounds)	4.00c
Philadelphia (shapes)	4.50c
San Francisco (rounds)	5.00c
Seattle (rounds)	5.40c
Los Angeles (rounds)	5.10c

Warner street, plans the erection of a building, 48 x 80 feet.

BALTIMORE—Charles L. Rhode & Sons plan to rebuild the section of their shipyard recently damaged by fire.

BALTIMORE—Plans are being prepared by the Baltimore & Ohio railroad for two piers at its waterfront terminal to cost $2,000,000.

BALTIMORE—Property has been purchased by the Baltimore Ship Repair Co. at Covington and Montgomery streets for a new plant.

BALTIMORE—The Columbia Co., Inc., 1508 East Fayette street, has been organized to manufacture tin boxes, cans, etc., by William P., Timothy R. and A. J. Ryan.

BALTIMORE—The Utility Mfg. Co., Inc., 1824 Lancaster street, has been incorporated by Walter B. and Craig N. Wills to manufacture wire and metal products.

BOSTON—The Magee Furnace Co. is installing machinery at the plant of the Gibby Foundry Co., Wakefield, Mass., to assemble hot water heaters.

BENTON HARBOR, MICH.—The plant of the Benton Harbor Drop Forge Co. recently was damaged by fire.

DETROIT—The Unique Brass Mfg. Co., 123 Military avenue, plans to rebuild its plant recently damaged by fire.

LANSING, MICH.—The Reo Motor Car Co. plans the erection of a storage and shipping building.

MANISTIQUE, MICH.—The Manistique Brass & Bronze Co. plans the erection of a plant addition.

ROCHESTER, MICH.—The Oakland Foundry & Machine Co. has been incorporated with $25,000 capital stock by Edward F. Striker, Will Becht, Henry Albright and others.

BURLINGTON, N. J.—Plans are being prepared by the United States Cast Iron Pipe & Foundry Co. for an addition to its plant in this city.

BROOKLYN, N. Y.—The Frankfort Heating Co., 4418 Thirteenth avenue, plans the erection of a plant building, 100 x 100 feet.

BUFFALO—The Peerless Husker Co., 523 Cornwall avenue, manufacturer of canning machinery, plans the erection of an addition, 82 x 86 feet.

LONG ISLAND CITY, N. Y.—Property has been purchased here by the Atlas Novelty Co., East Eleventh street, New York, for a plant.

NEW YORK—The Barrett Co., 40 Rector street, plans the erection of a 1-story plant building at Shadyside, N. J.

NEW YORK—The Consolidated Art Metal Foundry has been incorporated with $10,000 capital stock by M. E. Einhorn and R. L. White. The company is represented by W. Post, 50 Church street.

SYRACUSE, N. Y.—The Rollway Bearing Co. has been incorporated to make roller bearings with $200,000 capital stock by W. C. Lipe, A. T. Brown and J. T. R. Bell. The company is represented by Hancock, Dorr, Spriggs & Hancock, attorneys.

HICKORY, N. C.—The Hickory Chair Mfg. Co. plans the erection of a 1-story plant building, 75 x 225 feet to cost about $45,000.

SALISBURY, N. C.—The Autovac Co. recently was organized with $300,000 capital stock by H. A. Rouzer, A. L. Smoot and others.

CLEVELAND—A 1-story frame building at the plant of the Allyne-Ryan Foundry Co. recently was damaged by fire.

CLEVELAND—The Cleveland Steel Co. is reported planning the erection of a steel plant unit. Offices of the company are in the Kirby building. Plans are indefinite.

CLEVELAND—The Atlas Foundry Co., Shaw avenue, plans the erection of a modern foundry building, at West Seventy-third street and Denison avenue.

CLEVELAND—The Worldseye Co. has established a plant in a building at 5209 Prospect avenue, for the production of motion picture projecting machines. Edward L. Frantz is president of the company.

CLEVELAND—The Peerless Iron Works & Nut Co. has been incorporated with $60,000 capital stock by John A. Elden, Hippodrome building, W. L. Stevens, F. Kilby, A. M. Stevens and A. B. Stevens

COSHOCTON, O.—The Jones Metal Products Co. has been organized. It is understood it will succed to the business of the West Lafayette Enameling Co., whose plant and equipment recently was bought at a receiver's

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago** **Detroit**
San Francisco
Cincinnati

sale by Frank Jones, one of the organizers of the new company.

ELYRIA, O.—The Colson Co. plans the erection of an addition to its plant.

GALION, O.—The Galion Iron Works plans a modern factory building.

HAMILTON, O.—The Druro Pump & Mfg. Co. plans a 5-story factory building.

HUDSON, O.—The foundry at the plant of the Hazen Mfg. Co. recently was damaged by fire.

LAFAYETTE, O.—The Jones Metal Products Co. has been incorporated with $500 capital stock by Frank E. Jones, Herbert Boyer and others.

MASSILLON, O.—The plant of the Everhard Sand & Brick Co. recently was damaged by fire.

MIDDLETOWN, O.—The Bevis & Shartle Machine Co. has let the contract for the erection of an addition.

MINERVA, O.—The American Electric Switch Co. has been organized with $150,000 capital stock by J. C. Lewis and others to manufacture electric switches, etc.

NILES, O.—The Falcon Steel Co. plans the erection of an addition to its galvanizing department.

NILES, O.—The Ohio Galvanizing Co. has awarded a contract to the Warren Engineering Co. for a plant addition, one story, 76 x 120 feet.

TIFFIN, O.—The Monarch Mfg. Co., F. B. Cramer general manager, plans an addition.

WASHINGTON COURT HOUSE, O.—The Washington Gas & Electric Co. plans to erect an addition.

CANONSBURG, PA.—The Canonsburg Steel & Iron Co. plans the erection of a 2-story addition, 80 x 200 feet, to cost about $35,000.

CORRY, PA.—The Ajax Iron Works is said to be contemplating the erection of a machine shop.

ELLWOOD CITY, PA.—The Press-Weld Products Co. has been incorporated with $100,000 capital stock by David Frew, John W. Offutt and Ralph R. Titsworth.

ERIE, PA.—The Erie Foundry Co. plans the erection of a 2-story building, 35 x 70 feet to cost about $20,000.

HARRISBURG, Pa.—The Morganthau Electric Co., 204-6 Market street, plans the erection of a 2-story factory building, 80 x 110 feet to cost about $90,000.

OIL CITY, PA.—The Penn-American Refining Co. plans the erection of a 1-story power house, 45 x 60 feet.

PHILADELPHIA—The Baldwin Locomotive Works will start work shortly on alterations to its tender shop, costing $40,000.

PHILADELPHIA—The Quaker City Rubber Co., 624 Market street, has completed plans for the erection of a 2-story building, 31 x 70 feet.

PITTSBURGH—The Gulf Refining Co. plans the erection of a 2-story machine shop and general operating works, 40 x 130 feet, at its Reading, Pa., plant.

YORK, PA.—The B. M. Root Co., 30-38 Jefferson avenue, plans the erection of a 1-story addition.

COLUMBIA, S. C.—The Satifax Mfg. Co. has been incorporated by Joseph Norwood, J. W. Crim and others to manufacture farming and vehicular devices.

HUBBELL, W. VA.—The pump house at the plant of the Huntington Gas & Development Co. recently was damaged by fire.

MADISON, WIS.—Inquiry for additional machinery is being made by the Wisconsin Truck Co. for the enlargement of its machine shop and assembling plant at 18-24 North Charter street, following the transfer of the plant of the Six-Wheel Truck Co. of Fox Lake, Wis., to Madison.

MANITOWOC, WIS.—Sam W. Randolph, broker in foodstuffs, will build a warehouse, 125 x 400 feet, on the harbor to serve lake vessel lines, at a cost of about $50,000.

MILWAUKEE—A general woodworking plant will be opened at Thirty-fifth and Hadley streets by the newly organized Builders Millwork Co., of which John Rauwald is general manager and J. G. Jansen, president. Machinery is now being purchased.

MILWAUKEE—R. L. Clark, head of the Badger State Motorcycle Co., 2218 Meinecke avenue, will build a 2-story building at Twentieth street and Fon du Lac avenue, for a display and sales room, garage and repair shop. It will be 110 x 140 feet, with the second floor arranged as apartments. Architect Charles H. Tharinger is taking bids.

MILWAUKEE—Archie O. Muehl, secretary, board of industrial education, is asking sealed bids until March 1 for the installation of a complete shaving and dust collection system for all machines in the cabinet shop of the new $1,000,000 addition or second unit of the Milwaukee Central Continuation school.

SHEBOYGAN, WIS.—A 2-story fireproof addition, 40 x 75 feet, will be built by the Schneidewind & Zehm Motor Co. at Four-

New Trade Publications

PLATFORMS AND BOXES—The Truscon Steel Co., Youngstown, O., has published a 16-page illustrated booklet in which platforms and boxes and other equipment for handling material are described and illustrated.

MILWAUKEE—An attractive 32-page illustrated booklet has been published by the Milwaukee board of harbor commissioners, containing an historical, descriptive and prospective treatise on the port of Milwaukee. Harbor work is described and illustrated, as is the development of trade in coal, grain, etc.

LININGS—The Quigley Furnace Specialties Co., New York, is circulating an 8-page illustrated folder in which refractory material for lining and patching cupolas, ladles, converters, pit furnaces, tilting crucible and open-flame furnaces, etc., is described and its use illustrated.

FLANGING AND BENDING PRESSES—The Morgan Engineering Co., Alliance, O., is circulating a 24-page illustrated booklet in which flanging and bending presses are described and illustrated. The illustrations are of presses which have been built for various companies and include a 1000-ton hydraulic flanging press for the American Car & Foundry Co., Detroit; a 200-ton hydraulic flanging press for Struthers, Wells & Co., Warren, Pa.; an 800-ton hydraulic angle bending and plate straightening press for the Diebold Safe & Lock Co., Canton, O.; and a 1500-ton hydraulic flanging and stamping press for the Bethlehem Steel Co., South Bethlehem, Pa. Specifications of the various presses are given.

TRUCKS—The Sabin Machine Co., Cleveland, has published a 12-page illustrated booklet in which factory trucks are described and illustrated. The trucks have frameworks of electric steel castings and angle iron. The wheels are of semisteel, heavily ribbed to withstand shocks and are of large diameter to facilitate easy rolling. They are machine finished. Axles are machined from 0.40 per cent carbon steel. An extension foot pedal is used on all trucks with the exception of one type. This increases the leverage and makes it easy for a man of medium build to "break over" loads up to 1600 pounds, eliminating the need for helpers. Steel handles are furnished as standard equipment and all trucks are equipped with legs so they will stand in an upright position when not in use. Specifications and uses of various types are given.

LATHE FIXTURE—The Beyer Machine Co., Jackson, Mich., is circulating a 4-page illustrated booklet in which an angle plate lathe fixture is described and illustrated. This fixture is designed to do away with the old method of bolting an adjusting an angle plate to the face plate of a lathe. The body of the fixture is recessed on the back side to take a flanged plate that screws onto the lathe spindle the same as for the ordinary lathe chuck and is drilled and tapped for bolting it in place. The fixture is quickly attached and readily adjustable transversely by means of a screw and chuck wrench to bring the work to center of rotation. A scale reading on the side for approximate set-ups and also a graduated dial on the screw for micrometer adjustments are provided. The slide can be rigidly locked in place by means of a screw on the gib side. Other features are described.

SPEED REDUCERS—Spur gear speed reducers are described and illustrated in a 96-page illustrated booklet recently published by the W. A. Jones Foundry & Machine Co., Chicago. This reducer is designed for stepping down speeds between electric motors and driven machines. The reduction is obtained by an enclosed spur gear drive, constructed so that all moving parts operate under favorable conditions in an oil bath. The high speed shaft and the low speed shaft are concentric and have the same direction of rotation. A flexible coupling connects the motor shaft to the high speed reducer shaft permitting the armature shaft of the motor, while operating, to float freely in its bearings. Another flexible coupling connects the low speed reducer shaft to the shaft of the driven unit causing rotation at any predetermined speed to suit the requirements. The final speed depends on the revolutions per minute at the motor and the reduction ratio selected in the reducer.

ULTIMATE STEELS

To those who require Fine Steels —

THE ATLAS POLICY AND THE ATLAS PLEDGE

THE Officers, Directors, Operating and Sales Personnel of The Atlas Steel Corporation are pledged to the fulfillment of a definite policy:

Quality	The manufacture of none but the highest grades of fine steels.
Fair Dealing	A code of fair dealing which recognizes the viewpoint of the customer and subordinates the self-interest of the manufacturer.
Deliveries	A promise of delivery that is given with the honest intention of its fulfillment and which is based on an accurate analysis of mill schedules.
Price	A price that shall always be fair and that shall represent the only price at which steel of equal quality can be purchased by any consumer.

Behind the Atlas policy is a thorough sincerity of purpose, reflected in the personnel of its officers and directors, a group of executives who are prominently identified with the progress and development of the steel industry.

In order that Atlas men may keep Atlas pledges of quality and deliveries, they have been given the most modern of economical, well-rounded mill equipment, supplemented by warehouses and distributors in cities throughout the United States and Canada.

Those who require fine steels will find in The Atlas Steel Corporation, not only a source of supply for steels of the finest quality, but men whose word may be taken at its full meaning.

High Speed Steels *Carbon Tool Steels* *Alloy Tool Steels*
Automotive Steels *Die Steels* *Special Analysis Steels*
Cold Drawn Products *Carbon and High Speed Drill Rod*

THE ATLAS STEEL CORPORATION

GENERAL OFFICES, DUNKIRK, N. Y.

Plants: DUNKIRK, N. Y. CHARLEROI, PA. WELLAND, ONT.

District Sales Offices: New York Boston Philadelphia Buffalo Pittsburgh Atlanta Indianapolis Cleveland Detroit Chicago St. Louis

Warehouses: Dunkirk, N. Y. Charleroi, Pa. Boston Detroit Chicago Welland, Ont.

teenth and Indiana avenues, at a cost of $30,000, including additional shop fixtures and tools.

SLINGER, WIS.—The Reliance Foundry Co. has been incorporated with $25,000 capital stock by Frank R. Herman, John Wevers and James H. Wilkins.

SPOONER, WIS.—A $60,000 roundhouse and repair shop, with 28 stalls and modern drop pits, is being erected here by the Chicago, St. Paul, Minneapolis & Omaha railroad. J. E. Donlin, St. Paul, Minn., has the general contract.

West of the Mississippi

ADA, OKLA.—William Gilbert plans the erection of a machine shop at Rawlins, Wyo.

DALLAS, TEX.—The Dallas Brass Mfg. Co. plans the erection of a 1-story addition, 50 x 100 feet.

WACO, TEX.—The E. Nelson Mfg. Co., 710 Mary street, plans the erection of two buildings, one 1-story, 45 x 165 feet, and the other 2-stories, 26 x 85 feet.

VANCOUVER, WASH.—The Vancouver Foundry & Machinery Co. has been incorporated with $15,000 capital stock by Edward Rohrer, Charles W. Hall and J. B. Atkinson.

Business in Canada

FORD, ONT.—The Ford Motor Co. of Canada, will change the equipment in its plant here to individual or direct motor drive. This change will necessitate the installation of about 2600 motors.

GUELPH, ONT.—The Ontario Malleable Iron Co. has purchased a site on which it plans to erect a plant addition.

KIRKELAND LAKE, ONT.—The Lake Shore Mining Co. is enlarging its plant.

MONKTON, ONT.—The town council is contemplating installing hydroelectric power plant and system.

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.95
Mesabi Bessemer, 55 per cent iron	5.70
Old Range nonbessemer, 51½ per cent iron	5.20
Mesabi nonbessemer, 51½ per cent iron	5.05

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent	9.50 to 10.50

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	9.00 to 10.00
Algerian low phosphorus, 52 to 54 per cent	10.00 to 11.00
Swedish and Norwegian low phosphorus, 68 per cent	11.00 to 11.50
Swedish foundry or basic, 68 per cent	9.00 to 9.50
Spanish foundry or basic, 52 to 54 per cent	8.00 to 9.00

Manganese Ore

Brazilian, minimum 47 per cent, 33 cents, c.i.f. Atlantic ports.
Indian, 48 to 50 per cent, 33 cents c.i.f. Atlantic ports, 35 cents per unit
Caucasian, 53 to 55 per cent, nominal.

Fluor Spar

85 and 5% grade
Washed gravel, Kentucky and Illinois mines, per ton..... $21.50

Rivets

Structural rivets, Pittsburgh	3.00c
Boiler rivets, Pittsburgh	3.10c
Rivets, ½-inch and smaller	65 and 5 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1½ inches inclusive)

Hot pressed square or hexagon blank or tapped	$3.25 to $3.50 off list
Cold punched square or hexagon blank or tapped	$3.25 to $3.50 off list
Cold punched semifinished hexagon nuts ½-inch and larger	70-10-2½ off
Cold punched semifinished hexagon nuts 9/16-inch and smaller	70-10-5 off
Cast hardened, finished, hexagon	65-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
¾ x 6 inches, smaller and shorter

Rolled thread	50-10-5 off
Cut thread	50 off
Larger and longer	50 off

MACHINE BOLTS
(¾ x 4 inches, hot pressed nuts)

Rolled thread	60-5 off
Cut thread	50-10 off
Larger and longer	50-10 off
(¾ x 4 inches, cold punched nuts)	
Cut thread	45 off
Larger and longer	45 off
Lag screws	50-10 off
Ploy bolts Nos. 1, 2 and 3 heads	50-5 off
Tap bolts	30 off
Bolt ends with hot pressed nuts	50-10 off
Bolt ends with cold punched nuts	45 off
Blank bolts	50-10 off
Rough stud bolts with nuts	45 off

WASHERS

Wrought washers	$5.75 off list

Steel Pipe

(Effective Feb. 1-3, 1923)

Pittsburgh basing discounts, jobbers, car-

	Black	Galvanized
Butt Weld		
⅛-inch	47	21½
¼ and ⅜-inch	53	27½
½-inch	58	44½
¾-inch	62	50½
1 to 3-inch	64	52½
Lap Weld		
2-inch	57	45½
2½ to 6-inch	61	49½
7 to 8-inch	58	45½
9 to 12-inch	57	44½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	43	26½
¼ and ⅜-inch	49	32½
½-inch	55	44½
¾-inch	60	49½
1 to 1½-inch	62	51½
2 to 3-inch	63	52½
Lap Weld		
2-inch	55	44½
2½ to 4-inch	59	48½
4½ to 6-inch	58	47½
7 to 8-inch	54	41½
9 to 12-inch	48	35½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	44	34½
¾ to 1½-inch	47	37½
2 to 2½-inch	49	39½
Lap Weld		
2-inch	43	34½
2½ to 4-inch	45	36½
4½ to 6-inch	44	35½
7 to 8-inch	40	27½

Wrought Iron Pipe

(Effective Jan. 23, 1923)

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
THREADS AND COUPLINGS		
Butt Weld		
¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	29	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
7 to 8-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	..

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL
(Effective Jan. 23, 1923)

1¾-inch	17½ off
2 and ¼-inch	20 off
2½ to 3-inch	40 off
3¼ to 4-inch	45 off

CHARCOAL IRON
(Effective Dec. 6, 1922)

1½-inch	+16
1¾-inch	+ 6
2 and 2¼-inch	4
2½ to 3-inch	9
3¼ to 4½-inch	11

SEAMLESS COLD DRAWN
(Effective Jan. 24, 1923)

1-inch	51
1¼ and 1½-inch	43
1¾-inch	27
2 and 2¼-inch	27
2½ and 2¾-inch	31
3-inch	35
3¼ to 4-inch	40
4½ and 5-inch	32

SEAMLESS HOT ROLLED

3-inch	37
3¼ to 4-inch	42

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TURING
Base Discounts

Carbon, 0.10 to 0.20 per cent	85 off
Carbon, 0.30 to 0.40 per cent	83 off
Carbon, 0.40 to 0.50 per cent	82 off

Plus usual differentials and extras for cutting.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot, f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	14c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	19c
3-inch	7-gage	34c
1½-inch	9-gage	13¼c
5¼-inch	9-gage	53c
5½-inch	9-gage	55c

Plus usual extras for forming and for long lengths.

SIVYER CASTINGS
DEPENDABLE

Bracket casting for Automatic Mechanical Shoveling Machine, made of Sivyer High Carbon Electric Steel

Safeguarding Mining Machinery against Failure in Service

AN exceptionally successful manufacturer of mining machinery works always on the principle that materials are quite as important as design. He believes that breakdowns underground are so much more costly and troublesome than failures above ground that only the best metal obtainable can ever be considered good enough. To assure the durability, economy and efficiency of his product, he uses castings of Sivyer Electric Steel for critical parts. Other builders of mining machinery use Sivyer Electric Steel and Sivyer Electric Alloys for similar reasons, and also because they have found that with them they can reduce machining time in some cases as much as an hour per casting.

Send Blue Prints

If certain parts of your product—which are now either cast or hammer-forged and welded—ought to be more effectively safeguarded against failure in service, send us your blue prints with an explanation of your difficulties. We will be glad to study the problems involved and recommend possible solutions without obligation on your part.

If some of your planing and boring tools require an unusual amount of grinding and replacement, it may be that there are sand and slag on the surface of some of the castings now used. Tools are keen inspectors of castings and originate many of the orders that come to Sivyer from more than a thousand miles away. If your usual sources of supply seem unable to get rid of the trouble, send us your blue prints of the parts in question, together with details about your difficulties. Without obligation on your part we will study the problems of molding practice involved and suggest methods for producing castings with uniformly good machining quality.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Iron and Steel Production

Compiled By IRON TRADE REVIEW

Pig Iron

	-Stacks- No.	In	Output Total	Av. daily
1907				
January	376	311	2,174,801	69,509
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,299,732	
1908				
January	398	139	1,081,813	34,316
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,680,140	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,186
October	413	309	2,589,681	84,001
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,337,002	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,747
March	417	310	2,588,736	83,580
April	418	291	2,477,700	82,590
May	421	206	1,871,388	60,367
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,793	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,192
Total			26,840,314	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,867
April	421	220	2,044,904	68,163
May	421	206	1,871,388	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,287,800	89,929
February	423	306	2,778,670	92,095
March	423	278	2,562,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,716,825	90,865
June	422	283	2,816,883	87,229
July	422	264	2,658,275	82,525
August	424	260	2,537,318	81,839
September	425	258	2,594,098	83,137
October	425	244	2,439,924	81,933
November	424	225	2,529,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	355	3,238,970	104,483
September	431	344	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,794
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,602
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,270
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,168
September	434	317	3,124,308	104,173
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,927,088	68,906
March	436	103	1,593,542	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	435	69	954,901	30,802
September	435	84	985,795	32,857
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	
1922				
January	430	127	1,645,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,035,908	65,638
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495
June	427	191	2,362,455	78,748
July	427	170	2,403,030	77,517
August	427	143	1,810,665	58,408
September	427	189	2,024,008	67,466
October	428	218	2,629,655	84,827
November	428	240	2,846,110	94,870
December	428	253	3,084,318	99,494
Total			26,851,642	
1923				
January	428	261	3,226,065	104,066

Ingots and Castings

By American Iron and Steel Institute

	Ingots	Castings	Total
1916	41,401,917	1,371,763	42,773,680
1917	43,619,200	1,441,407	45,060,607
1918	43,051,022	1,411,410	44,462,432
1919	33,694,795	976,437	34,671,232
1920	40,881,392	1,251,542	42,132,934
1921	19,184,084	559,713	19,743,797

Monthly Ingot Output

1922	Gross Tons 87.5 per cent of capacity	Indicated total
January	1,593,482	1,820,000
February	1,745,022	1,995,000
March	2,370,751	2,710,000
April	2,444,513	2,800,000
May	2,711,141	3,100,000
June	2,634,477	3,010,000
July	2,487,104	2,840,000
August	2,214,582	2,530,000
September	2,373,779	2,710,000
October	2,872,415	3,280,000
November	2,889,297	3,300,000
December	2,779,890	3,175,000
Total	29,116,453	33,270,000
1923.		
January	3,251,694	3,730,000

Cutting Costs And Increasing Production

Brownhoist Products

Heavy Dock Machinery
Locomotive Cranes
Monorail Trolleys
Concrete Bunkers
Chain Conveyors
Belt Conveyors
Coal Crushers
Bridge Cranes
Buckets, etc.

With a dependable conveyor to handle your materials you can cut your operating costs and increase your production. Brownhoist chain conveyors are built for hard work and will give years of dependable service.

The Brownhoist drop-forged chain link has an I-beam shaped bar, giving maximum strength and rigidity with minimum weight. Wide upset ends afford large wearing surfaces and these with the cold rolled steel pins take all the wear. Of course, these tough, oversize bearing surfaces give longer life to the chain.

For nearly fifty years Brownhoist engineers have been solving handling problems. As builders of many types of equipment we are ready at all times to give you sincere advice on your material handling.

The Brown Hoisting Machinery Co., *Cleveland, O.*
Branch Offices: New York, Chicago, Pittsburgh, San Francisco, New Orleans

MATERIAL HANDLING EQUIPMENT

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$15.00 to 16.00
Boston (dealers)	17.00 to 17.50
Chicago	19.75 to 20.00
Buffalo	22.50 to 23.50
Cleveland	21.50 to 22.00
Cincinnati	19.50 to 20.00
Detroit (dealers)	20.00 to 20.50
Eastern Pennsylvania	20.50 to 21.50
New York (dealers)	17.25 to 17.75
Pittsburgh	24.00 to 24.50
San Francisco	14.00
St. Louis	19.50 to 20.00
Valleys	24.00 to 24.50
No. 1 railroad steel New York (dealers)	18.00 to 18.50

BUNDLED SHEETS

Buffalo	$15.50 to 16.25
Cleveland	16.50 to 17.00
Cincinnati	14.00 to 14.50
Detroit	16.00 to 17.00
Eastern Pennsylvania	18.50 to 19.00
Pittsburgh	20.50 to 21.00
St. Louis	12.25 to 12.75
Valleys	19.50 to 20.00

STEEL RAILS, SHORT

Birmingham	$22.00 to 23.00
Boston (dealers)	17.00 to 17.50
Chicago	24.00 to 24.50
Cincinnati	23.00 to 24.00
Cleveland	20.50 to 21.00
St. Louis	22.50 to 23.00

STOVE PLATE

Birmingham	$19.00 to 20.00
Boston (consumers)	17.00 to 18.00
Buffalo	20.00 to 20.50
Chicago	22.75 to 23.25
Cincinnati (net)	17.50 to 18.00
Cleveland	20.00 to 20.50
Detroit (net tons) (dealers)	17.00 to 17.50
Eastern Pennsylvania	19.50 to 20.50
New York (dealers)	17.00 to 17.50
Pittsburgh	17.50 to 18.00
St. Louis	21.00 to 21.50

LOW PHOSPHORUS

Buffalo	24.50 to 25.50
Cincinnati	20.00 to 21.00
Eastern Pennsylvania	25.00 to 26.00
Pittsburgh billet and bloom crops	27.50 to 28.00

SHOVELING STEEL

Chicago	19.00 to 19.50
Pittsburgh	19.50 to 20.00
St. Louis	19.00 to 19.50

KNUCKLES, COUPLERS & SPRINGS

Chicago	26.00 to 26.50
Eastern Pennsylvania	25.00 to 26.00
Pittsburgh	26.00 to 26.50
St. Louis	27.00 to 27.50

COMPRESSED SHEETS

Buffalo	20.50 to 21.50
Chicago	17.50 to 18.00
Pittsburgh	22.50 to 23.00
Cleveland	19.25 to 19.50
Detroit (dealers)	17.00 to 18.00
Valleys	21.50 to 22.00

FROGS, SWITCHES, GUARDS

Chicago	20.00 to 20.50
Eastern Pennsylvania	20.50 to 21.50
St. Louis	21.00 to 21.50

BOILER PLATE, CUT

St. Louis (dealers)	$15.00 to 15.50

ANGLE BARS—STEEL

Chicago	22.00 to 22.50
St. Louis	19.00 to 19.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	$20.00 to 21.00
Boston (dealers)	18.00 to 19.00
Buffalo	20.00 to 21.00
Chicago, No. 1	20.50 to 21.00
Chicago No. 2	19.50 to 20.00
Cincinnati No. 1	17.50 to 18.50
Cleveland No. 1	20.00 to 21.50
Eastern Pennsylvania, No. 1	25.00 to 25.50
Pittsburgh No. 1	22.50 to 23.00
Pittsburgh, No. 2	24.00 to 24.50
New York, No. 1 (dealers)	20.00 to 21.00
St. Louis, No. 1	20.00 to 20.50
St. Louis, No. 2	19.00 to 19.50

WROUGHT PIPE

Boston (dealers)	14.00 to 14.50
Buffalo	18.50 to 19.00
Eastern Pennsylvania	19.00 to 19.50
New York (dealers)	15.50 to 16.00

YARD WROUGHT

Boston	$15.00 to 15.50
Eastern Pennsylvania	22.50 to 23.00

CITY WROUGHT

New York, long	$18.00 to 19.00

BUSHELING

Buffalo, No. 1	20.50 to 21.00
Chicago, No. 1	18.50 to 19.00
Chicago, No. 2	13.50 to 14.00
Cincinnati No. 1	17.50 to 18.00
Cleveland, No. 1	17.25 to 17.50
Cleveland, No. 2	15.00 to 16.00
Detroit, No. 1	16.00 to 16.50
Detroit No. 2 new	15.00 to 15.50
Detroit, No. 2 (old)	14.00 to 14.50
Eastern Pennsylvania, No. 1	17.50 to 18.00
Pittsburgh, No. 1	20.50 to 21.00
St. Louis, No. 1	18.00 to 18.50

MACHINE SHOP TURNINGS

Birmingham	12.00 to 12.50
Boston (dealers)	13.00 to 13.50
Buffalo	15.75 to 16.25
Chicago	14.50 to 15.00
Cleveland	16.75 to 17.00
Cincinnati (net)	13.00 to 13.50
Detroit (dealers)	14.00 to 14.50
Eastern Pennsylvania	19.00 to 19.50
New York (dealers	15.50 to 16.00
Pittsburgh	19.00 to 19.50
St. Louis	12.50 to 13.00
Valleys	17.00 to 17.50

CAST IRON BORINGS

Birmingham (Chemical)	16.00 to 16.50
Birmingham, borings (plaint)	12.00 to 12.50
Boston (chemical)	19.00 to 20.00
Boston (dealers)	14.00 to 15.00
Buffalo	17.50 to 18.00
Chicago	16.50 to 17.00
Cincinnati (net)	13.50 to 14.00
Cleveland	18.00 to 18.50
Detroit (dealers)	15.50 to 16.00
Eastern Pennsylvania	17.50 to 18.50
Eastern Pennsylvania (chemical)	19.00 to 19.50
Pittsburgh	20.50 to 21.00
New York (dealers' price)	16.00 to 16.50
St. Louis	14.00 to 14.50
Valleys	18.75 to 19.25

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	13.00 to 13.50
Cleveland	17.50 to 18.00
Detroit (dealers)	14.00 to 14.50
Eastern Pennsylvania	18.00 to 18.50
New York (dealers)	15.00 to 15.50

IRON AXLES

Birmingham	24.00 to 25.00
Boston	27.00 to 28.00
Buffalo	24.00 to 25.00
Chicago	30.50 to 31.00
Cincinnati	27.00 to 28.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	29.00 to 30.00
Pittsburgh	34.00 to 35.00
St. Louis	31.50 to 32.00

IRON RAILS

Buffalo	21.00 to 22.00
Chicago	25.00 to 25.50
Cincinnati	18.00 to 19.00
Cleveland	18.50 to 19.00
St. Louis	22.00 to 22.50

PIPES AND FLUES

Chicago	16.00 to 16.50
Cincinnati	14.00 to 14.50
Cleveland	17.00 to 17.50
St. Louis	15.00 to 15.50

RAILROAD GRATE BARS

Buffalo	20.00 to 20.50
Chicago	22.00 to 22.50
Cleveland	18.00 to 18.50
Eastern Pennsylvania	19.50 to 20.50
New York (dealers)	16.50 to 17.00
St. Louis	19.00 to 19.50

FORGE FLASHINGS

Boston (dealers)	13.50 to 14.00
Chicago, small	15.50 to 16.00
Cleveland	17.00 to 17.25
Cleveland, large	15.50 to 16.00
Detroit (Dealers)	16.00 to 16.50

FORGE SCRAP

Boston	$13.50 to 14.00
Chicago	19.50 to 20.00
Eastern Pennsylvania	19.00 to 20.00

ARCH BARS AND TRANSOMS

Chicago	28.00 to 28.50
St. Louis	26.50 to 27.00

ANGLE BARS—IRON

Chicago	28.00 to 28.50
St. Louis	26.50 to 27.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	$14.00 to 14.50
Buffalo	21.00 to 21.50
Chicago	18.00 to 18.50
Cleveland	18.50 to 19.00
Eastern Pennsylvania	19.00 to 20.00
Pittsburgh	21.00 to 21.50
St. Louis	16.00 to 16.50

STEEL CAR AXLES

Birmingham	24.50 to 25.00
Boston (dealers)	24.00 to 25.00
Buffalo	23.00 to 24.00
Chicago	25.50 to 26.00
Cleveland	23.50 to 25.00
Eastern Pennsylvania	24.00 to 25.00
New York (dealers)	22.00 to 23.00
Pittsburgh	25.00 to 25.50
St. Louis	26.50 to 27.00

SHAFTING

Boston (dealers)	24.00 to 25.00
Chicago	26.50 to 27.00
Eastern Pennsylvania	24.00 to 25.00
New York (dealers)	20.00 to 20.50
St. Louis	22.50 to 23.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	22.00 to 24.00
Birmingham iron	22.00 to 23.00
Boston (consumers)	20.00 to 21.00
Buffalo, iron	22.00 to 22.75
Chicago, iron	26.50 to 27.00
Cincinnati	21.00 to 21.50
Eastern Pennsylvania, cupola	25.00 to 26.00
New York, iron (dealers)	21.50 to 22.00
Pittsburgh, iron	26.00 to 26.50
Pittsburgh, steel	26.00 to 26.50
St. Louis, iron	27.00 to 27.50

NO. 1 CAST SCRAP

Birmingham cupola	$22.00 to 24.00
Boston (consumers)	23.00 to 24.00
Buffalo	24.00 to 25.00
Chicago, cupola	25.75 to 26.25
Cincinnati, No. 1, machinery, cupola (net)	22.50 to 23.00
Cleveland, cupola	24.00 to 25.00
Detroit (net ton) dealers)	22.00 to 23.00
Eastern Pennsylvania, cupola	24.00 to 25.00
New York, cupola (dealers)	21.50 to 22.00
Pittsburgh, cupola	25.00 to 25.50
San Francisco	26.00 to 27.00
St. Louis, agricultural	23.00 to 23.50
St. Louis, railroad	23.00 to 23.50
Valleys	23.00 to 24.00

HEAVY CAST

Boston (consumers)	20.00 to 20.50
Buffalo	21.00 to 21.50
Cleveland	17.00 to 18.00
Detroit automobile (net ton)	27.00 to 28.00
Eastern Pennsylvania	22.00 to 23.00
New York (dealers)	19.50 to 20.00
Pittsburgh	22.50 to 23.00

MALLEABLE

Boston (railroad)	24.00 to 25.00
Buffalo	25.50 to 26.00
Chicago, railroad	25.50 to 26.00
Chicago, agricultural	25.50 to 26.00
Cincinnati, agricultural	20.00 to 20.50
Cincinnati, railroad	22.00 to 23.00
Cleveland, agricultural	23.00 to 23.50
Cleveland, railroad, nominal	24.00 to 24.50
Detroit (dealers)	22.00 to 23.00
Eastern Pennsylvania, railroad	20.00 to 21.00
Pittsburgh, railroad	26.00 to 26.50
St. Louis, agricultural	23.00 to 23.50
St. Louis, railroad	23.50 to 24.00

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	22.00 to 22.50
Boston (dealers)	18.00 to 18.50
Chicago	22.00 to 22.50
Cleveland	25.00 to 25.50
Eastern Penrsylvania	25.00 to 25.50
New York (dealers)	20.50 to 21.00
Pittsburgh district	26.00 to 26.50
St. Louis	22.25 to 22.75

LOCOMOTIVE TIRES

Chicago	23.75 to 24.25
St. Louis	22.00 to 22.50

LOW PHOSPHORUS PUNCHINGS

Chicago	23.00 to 23.50
Eastern Pennsylvania	22.00 to 24.00
Pittsburgh	27.00 to 27.50